LABORATORY SUPPLIES
SCIENTIFIC APPARATUS
AND
CHEMICALS

"MINE & SMELTER"
MARCY MILLS
MECHANICAL · ELECTRICAL · CHEMICAL

CATALOG No. 94

**The
Mine & Smelter
Supply Co.**

DENVER–SALT LAKE CITY–EL PASO
NEW YORK

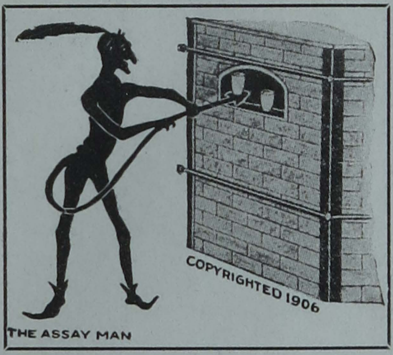
75.-
LDH

Catalog No. 94

Laboratory Supplies

Scientific Apparatus and Chemicals

For University, School, Industrial,
Assay, Testing and Mining
Laboratories



The
Mine & Smelter
Supply Co.

Denver, Colo.
Salt Lake City, Utah
New York City, N. Y.
U. S. A.
El Paso, Tex.

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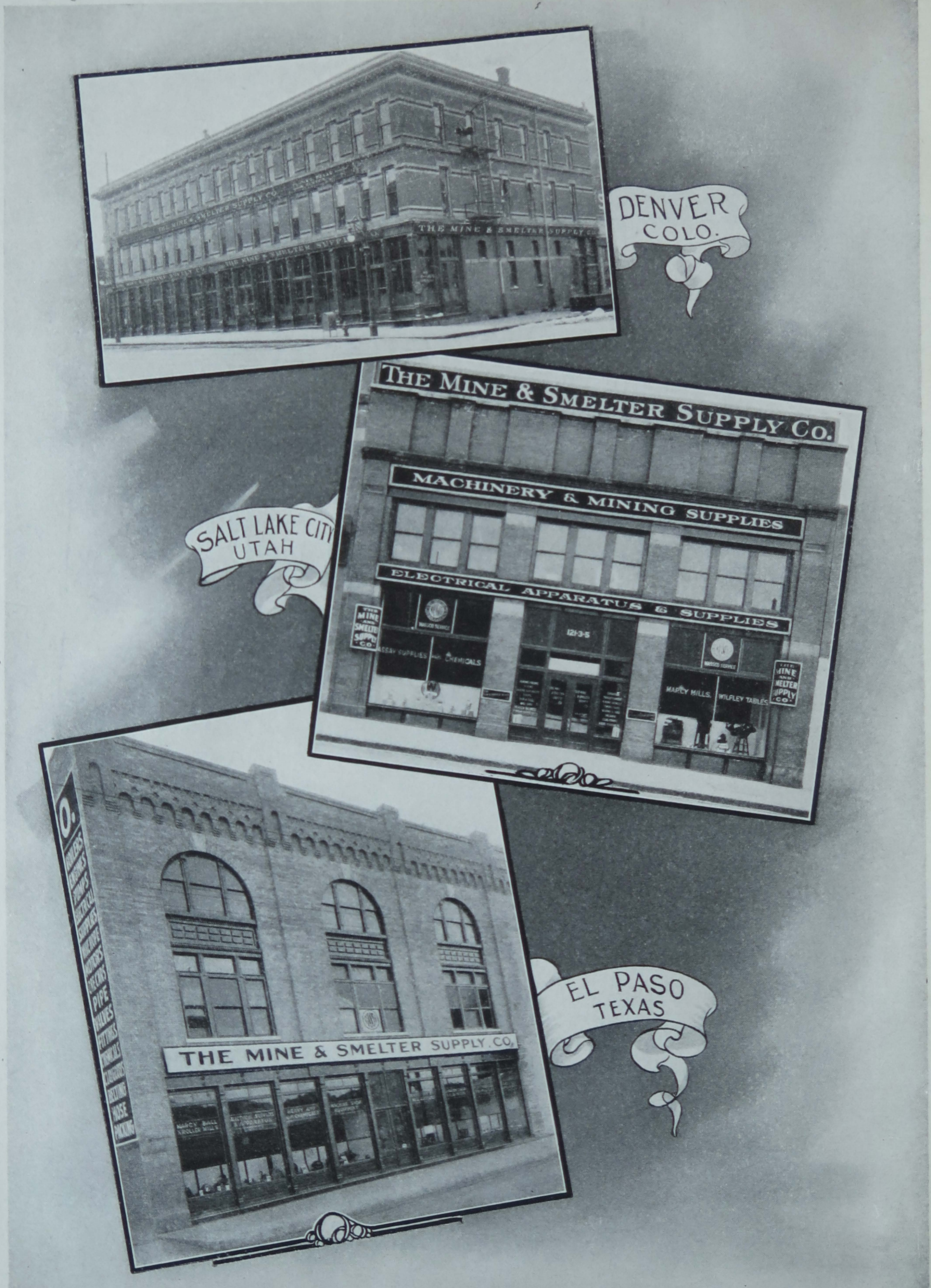
THE MINE & SMELTER SUPPLY CO.
DENVER COLO.
THE MINE & SMELTER SUPPLY CO.
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THE MINE & SMELTER SUPPLY CO.
BOILERS
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MARCY BALL & ROLLS MILLS
EL PASO TEXAS

Introduction

CATALOG NUMBERS. The items in this catalog are arranged in alphabetical sequence with the exception of specialized items peculiar to certain work, and which are listed in their respective sections such as cement testing apparatus, gas analysis, clinical laboratory apparatus, coal testing apparatus, etc. The catalog number of each item is made up from the number of the page on which it appears and the order in which it appears on that page, i. e., Extraction Flasks, Knorr, is Catalog Number 148M9 on Page 148 and the 9th item on that page.

ORDERS. When ordering, the catalog number, the name of the article, and the size desired should be stated. For convenience in ordering, the catalog number and the name of the article are shown in **bold-face type.** Where more than one size is listed under one catalog number, with each size having two or more lines of specifications, the identification to be used in ordering is shown in **bold-face type** for your convenience, making it unnecessary to copy the complete specifications to identify a particular item.

When ordering apparatus or equipment for alternating electric current, the voltage, cycle, and phase of current should be stated. Orders for gas-heated apparatus should state the type of gas to be used for operating the equipment , and the B. T. U. content.

PRICES. The prices shown are the current prices effective at the time of publication, and are subject to change without notice. Market conditions change from time to time and prices vary accordingly. The catalog prices are usually sufficiently accurate for estimating purposes, and formal quotations will gladly be submitted upon request.

The prices shown usually apply for the quantity stated, and larger quantities, in some instances, carry discounts, which vary with the quantity of the item ordered. A schedule of discounts on several standard lines will be found on the next page.

Most of the prices are F. O. B. our stores at Denver, Colorado, Salt Lake City, Utah, or El Paso, Texas; but in some instances are F. O. B. Factory.

ROUTING INSTRUCTIONS. Full shipping instructions should accompany all orders. Buyers located off transportation lines should specify to what point and by what routing goods are to be shipped, and to what postoffice invoices and shipping papers should be mailed.

In the absence of shipping instructions, it is understood that we are to use our own judgment and are not liable for any excess shipping charges that may result from incomplete information.

EXPORTS. Unless otherwise arranged, orders for export shipment should be accompanied by an irrevocable letter of credit to include cost of merchandise, transportation to destination, and export packing, established with any bank in the United States. Unless otherwise specified all export shipments by water will be covered by marine insurance, and the additional cost of such insurance added to the invoice. We are familiar with export regulations and packing. Our charge for ocean packing is furnished at cost, which usually amounts to 5% of the value of the goods.

LOSS AND DAMAGE IN TRANSIT. Our shipments are carefully packed by experienced packers, and carriers' receipt is secured for merchandise complete and in good condition; therefore the carrier is responsible for safe delivery.

In case of DAMAGE or BREAKAGE, call for an Inspector or Agent of the Transportation Company, and get their signed report in either case whether damage is apparent or concealed.

SHORTAGE of parcels should be noted on your receipt at the time shipment is delivered to you by the Transportation Company.

Claims for LOSS or DAMAGE should be filed by you within ten days after receipt of shipment.

If you need help in filing claims, our Traffic Department will gladly assist you in every way possible. In order to file claims complete, we must have the bill of lading, paid transportation receipt or delivery ticket, showing notation that shipment was short or damaged; also on Concealed Damage, the "Concealed Damage Report" must be furnished.

Please bear in mind our ability to help you in claims is entirely dependent upon your co-operation in seeing that these memoranda are furnished complete.

SHORTAGES. All shipments are double checked before leaving our shipping room to prevent errors and shortages. Claims for shortages must be filed with us within ten days after receipt of shipment.

RETURNED GOODS. Written permission must first be obtained from us before returning goods for credit or exchange.

When permission is obtained be sure to clearly mark the package with your name and address and write us promptly, sending us the shipping receipt and stating the date of our invoice on which the goods were billed.

STOCK POINTS AND BRANCH OFFICES. We maintain stocks of assay and chemical laboratory supplies and equipment, reagents, and heavy chemicals at Denver, Colorado, Salt Lake City, Utah, and El Paso, Texas, and maintain branch offices and agents throughout the world.

PACKING AND PACKAGE CHARGES. Our prices include the cost of preparing goods for domestic shipment; except that under some circumstances, where a special container is required for a small quantity of goods such as glass tubing or rod, a small charge is made. When export shipment must be packed for ocean shipment, a charge is made as outlined under "EXPORTS."

CODES AND CABLE ADDRESS. We use the following codes: Western Union, Postal Telegraph, Bentley's A. B. C., Bedford McNeill, Liebers Standard, and Moering and Neal General and Mining Code. Our cable address is "Minterply."

Quantity Prices

Prices in this catalog apply only for the quantity indicated. Larger quantities are usually subject to discounts or lower net prices, a portion of which are as follows.

Coors Porcelain Ware

Discounts apply to orders having a total list price of Coors Porcelainware as follows:

Less than $125.00	Net
$ 125.00	3%
250.00	5%
500.00	10%
750.00	15%
1000.00	20%

"EXAX" Blue Line Graduated Glassware

Net prices for single pieces, dozen lots and single case lots are shown in the catalog. Full cases may be assorted for quantity prices as follows:

5 cases	At net prices approximately 5% lower than single case prices.
10 cases	At net prices approximately 10% lower than single case prices.

MUNKTELL FILTER PAPER

Discounts apply to orders having a total list price of Munktell Filter Papers (may be assorted) as follows:

Less than $100.00	Net
$100.00	5%
$200.00	10%
$500.00	15%

CLAY CRUCIBLES AND SCORIFIERS

Full cases of crucibles and scorifiers of the various sizes may be assorted for quantity discounts as follows:

1 to 9 cases	10%
10 to 19 cases	15%
20 or more cases	20%

"Pyrex" Brand Laboratory Glassware

Net prices for single pieces and single case lots are shown in the catalog. Full cases may be assorted for quantity prices as follows:

20 cases	At net prices approximately 5% lower than single case prices.
50 cases	At net prices approximately 10% lower than single case prices.
100 cases	At net prices approximately 15% lower than single case prices.

S & S Filter Papers

Discounts apply to orders having a total list price of S & S Filter Papers (may be assorted) as follows:

Less than $100.00	Net
$100.00	5%
$200.00	10%
$500.00	15%

WHATMAN FILTER PAPERS

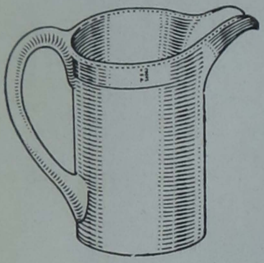
Discounts apply to orders having a total list price of Whatman Filter Papers (may be assorted) as follows:

Less than $100.00	Net
$100.00	5%
$200.00	10%
$500.00	15%

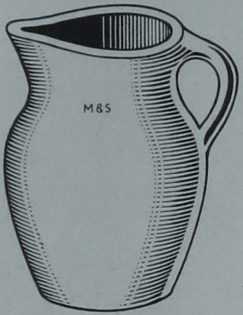
1M1

1M1 Acid Measures, Hard Rubber.

Capacity, pints	1	2
Each	**$2.50**	**3.00**



1M2



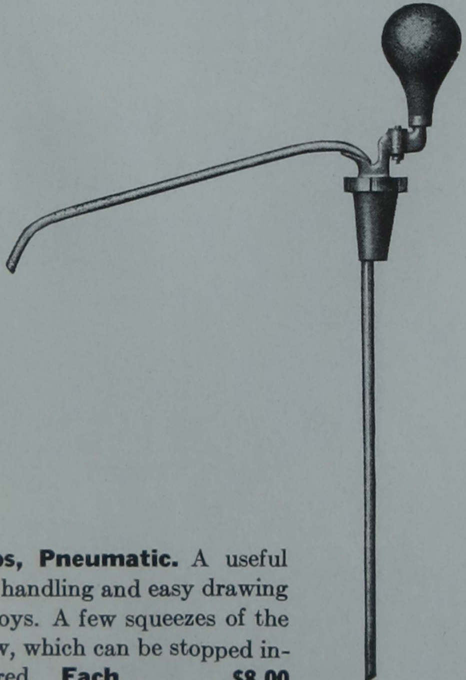
1M3

1M2 Acid Pitchers, Coors Porcelain. Glazed inside and outside with exception of outside bottom.

Size	**0**	**1**	**2**
Diameter, mm.	142	115	180
Height, mm.	84	163	245
Capacity, ml.	700	1200	4000
Each	**$2.60**	**3.60**	**5.25**

1M3 Acid Pitchers, Stoneware. With handle and pourout.

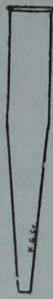
Capacity, gallons	**½**	**1**
Weight, pounds	3½	7
Each	**$1.60**	**2.00**



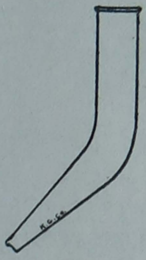
1M4

1M4 Acid Pumps, Pneumatic. A useful device for the safe handling and easy drawing of acids from carboys. A few squeezes of the bulb starts the flow, which can be stopped instantly when desired. **Each** **$8.00**

1M5 Bulbs Only. Each **$1.00**



1M6



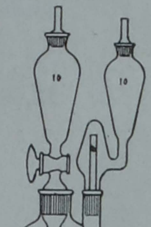
1M7

1M6 Adapters, Straight. Blown glass. With substantial walls and reinforced top.

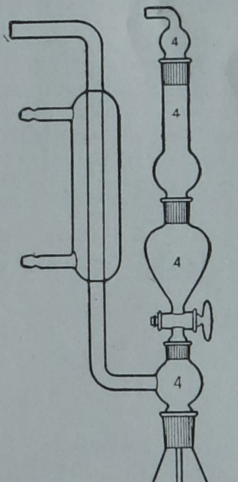
Length, mm.	**150**	**180**	**200**
Diameter, mm.	18	25	30
Quantity in case	72	72	72
Each	**$ .16**	**.18**	**.26**
Case	**$10.37**	**11.66**	**16.85**

1M7 Adapters, Bent to Angle of 45°. Blown glass. With substantial walls and reinforced top.

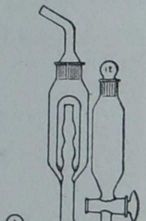
Length, mm.	**150**	**180**	**200**
Diameter, mm.	18	25	30
Quantity in case	72	72	72
Each	**$ .16**	**.18**	**.26**
Case	**$10.37**	**11.66**	**16.85**



1M8



1M9

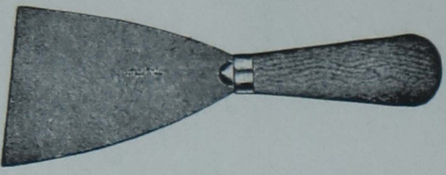


1M10

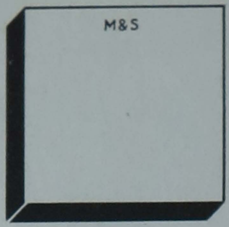
1M8 Alkalimeters, Geissler. Improved form for determination of CO_2. With all joints tightly ground.
Each, $6.00. Case of 6 .... **$32.40**

1M9 Alkalimeters, Knorr. For determination of CO_2 in carbonates. Recommended by the Association of Official Agricultural Chemists. With all joints tightly ground. Two flasks, made of resistant glass, are supplied with each apparatus. **Each, $10.00. Case** of 3 .... **$27.00**

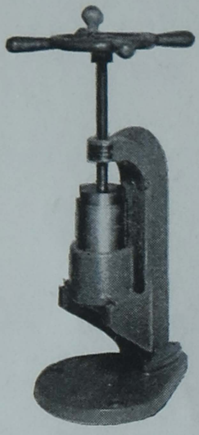
1M10 Alkalimeters, Schroedter. For determination of CO_2. With tube in flask and with all joints tightly ground.
Each, $5.50. Case of 6 .... **$29.70**



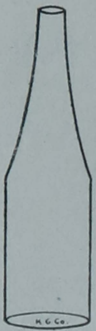
2M1



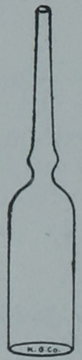
2M2



2M3



2M4



2M5

2M1 Amalgam Knives. With beech handle; polished crucible steel blade, 3 inches wide. Used for cleaning amalgam plates. **Each**.................................$ .65

2M2 Amalgam Scrapers. Pure gum rubber. Size, 6x6 inches; ½ inch thick. For dressing amalgamating copper plates. **Each**..$ .90

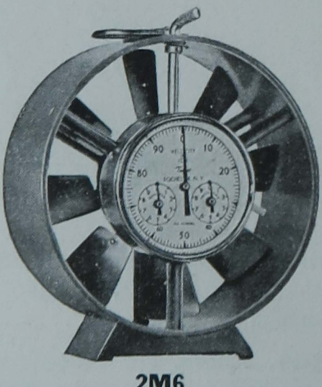
2M3 Amalgam Presses. Used to press excess mercury out of amalgam. The amalgam is wrapped in wet chamois skin and pressed in this machine. Cylinder, of steel, slotted on the sides and perforated on the bottom, will hold approximately 10 pounds. Shipping weight, 60 pounds. **Each**......**$25.00**

2M4 Ampoules. Glass. Uniform in capacity and design. Standard type.

Capacity, ml..........	1	2	5	10	20
Gross...............	**$2.40**	**2.70**	**4.05**	**6.75**	**11.20**

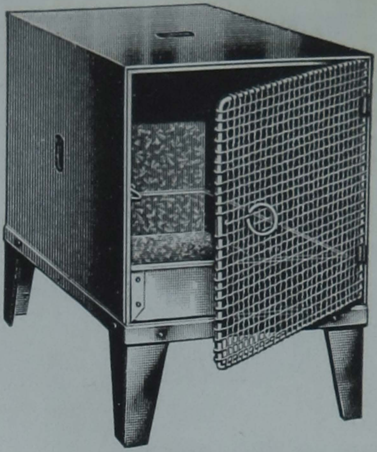
2M5 Ampoules. Glass. With constricted neck.

Capacity, ml..........	1	2	5	10	20
Gross...............	**$2.55**	**2.80**	**4.20**	**7.00**	**12.60**



2M6

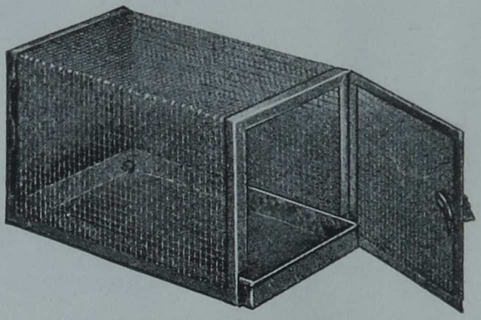
2M6 Anemometers, Taylor. For registering the velocity of currents of air in mines, tunnels, furnace flues, etc. 4 inches in diameter; with three dials reading to 10,000 feet; **jeweled movement;** disconnector; automatic zero-setting attachment; with corrections for use from 200 to 3000 feet per minute. Not guaranteed to give correct results when used in temperatures over 300° F. **Each,** in carrying case....**$40.00**



2M7

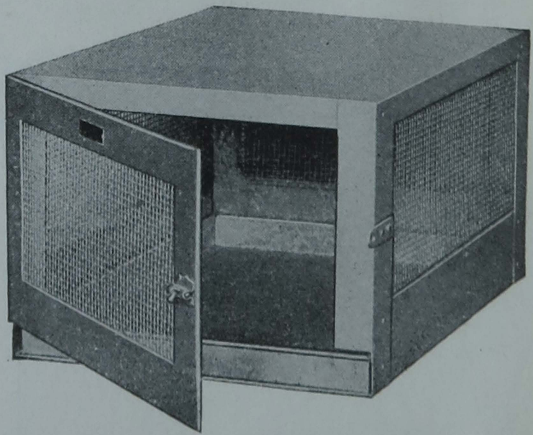
2M7 Animal Cages, Phipps Institute Model. For guinea pigs, rabbits, etc. The body of the cage is made of 24 gauge, and the pan of 22 gauge, galvanized Armco iron. The door is of 2 mesh 14 gauge wire cloth, galvanized after weaving. The sides, top and bottom are perforated with slots so that any number of cages may be bolted together. Finished with aluminum lacquer. Dimensions: 14 inches wide; 16 inches deep; 14 inches high.
Single cage only, without base. **Each**...............**$7.70**

2M8 Animal Cage Stands. For 2M7. 6¾ inches high; finished in aluminum lacquer. **Each**.................**$2.15**



2M9

2M9 Animal Cages, Walker. Suitable for mice or rats. Made of 3 mesh 18 gauge wire cloth, galvanized after weaving; mounted in framework of heavy galvanized rust-resisting Armco iron. Bottom and back are solid. Finished with aluminum lacquer. Dimensions: 9 inches wide; 15 inches deep; 9 inches high. **Each**.............................**$4.15**

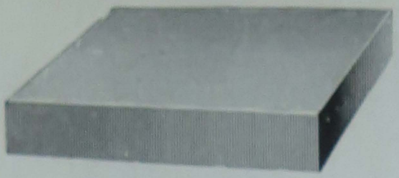


2M10

2M10 Animal Cages. For rabbits and smaller animals. Made of galvanized iron, and 3 mesh 18 gauge wire cloth galvanized after weaving. Finished with aluminum lacquer. Dimensions: 20 inches wide; 22 inches deep; 15 inches high. **Each**..**$12.00**

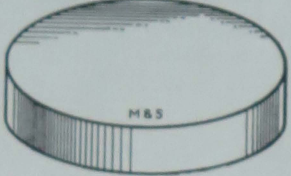
2M11 Animal Tags, Aluminum. With 2 holes.

Diameter, inches..........................	¼	½
Set of 100................................	**$4.50**	**1.00**



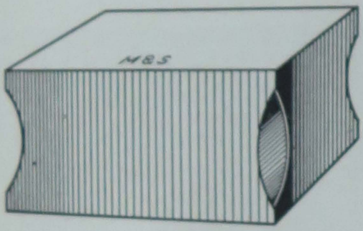
3M1

3M1 Anvils, Square. For lead buttons. 6 inches square by 1 inch thick. Planed on one side. **Each** **$3.75**



3M2

3M2 Anvils, Round. For lead buttons. 6 inches in diameter by 2 inches thick. **Each** **$3.75**



3M3

Anvils, High quality special steel. Carefully case-hardened. Surface is ground and nicely polished. Corner edges are milled to facilitate handling. Coated with rust-proof oil. Square shape.

3M3 Anvils, Platner's. 1½x1½x⅜ inch. Weight, 4 ounces. **Each** .... **$ .65**

3M4 Anvils. 2½x2½x1 inch. Weight, 1 pound, 11 ounces. **Each** **$2.00**

3M5 Anvils. 3x3x1 inch. Weight, 2 pounds, 8 ounces. **Each** **$2.50**

3M6

3M6 Anvils, Regular shape. The body is charcoal iron, and the face is covered with one solid piece of tool steel welded to the body. The horn is made entirely of untempered steel.

Size	**0**	**1**	**2**	**3**
Length, face, inches	5 1/16	5⅛	5⅞	7¼
Width, face, inches	2 5/16	2¼	2¾	2¾
Length, horn, inches	3 15/16	3⅞	4¾	4¾
Weight, pounds	10	15	20	30
Each	**$6.00**	**6.50**	**7.00**	**8.00**

3M7

3M7 Aprons, Laboratory. Full calendered, steam cured rubber fabric. Size, 36x46 inches. **Each** .... **$ .75**

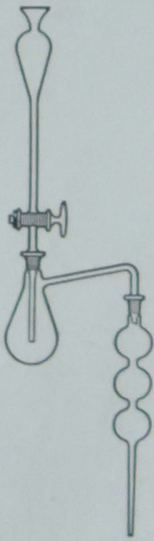
3M8 Aprons, Laboratory. Same as 3M7, except smaller. Size, 27x42 inches. **Each** .... **$ .60**

3M9 Aprons, Heavy Rubber. Fabric; double coated; with grommets. Size, 33x46 inches. Weight, approximately 2½ pounds. **Each** **$1.70**

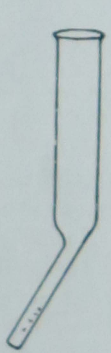
3M10 Aprons, Laboratory. Oiled silk pongee; full length; light weight. **Each** **$1.60**

3M11 Aprons, Oil and Gasoline Proof. Artificial rubber coated fabric; medium weight; full tapes. Size, 36x45 inches. Weight, approximately 1 pound. **Each** **$2.50**

3M12 Aprons, Asbestos. Fire and acid proof. Size, 36x30 inches. **Each** **$9.00**



3M13



3M14

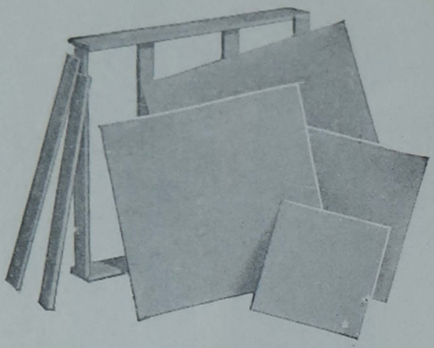
3M13 Arsenic Detection Apparatus, Knorr. Designed for use in the determination of arsenic. Consists of a funnel tube with stopcock, 6 flasks, and triple bulb condenser. **Complete** **$22.50**

3M14 Arsenic Tubes. Glass; curved. **Each, $ .10. Case** of 72 .... **$6.48**

3M15 Arsenic Test Strips, Reeve Angel. Not sensitized. Cut from genuine Whatman hand-made paper. Size, 2.5x-120 mm. **Box** of 500, **$4.00. Box** of 1000 .... **$7.50**

Asbestos

Asbestos Aprons, see page 3.

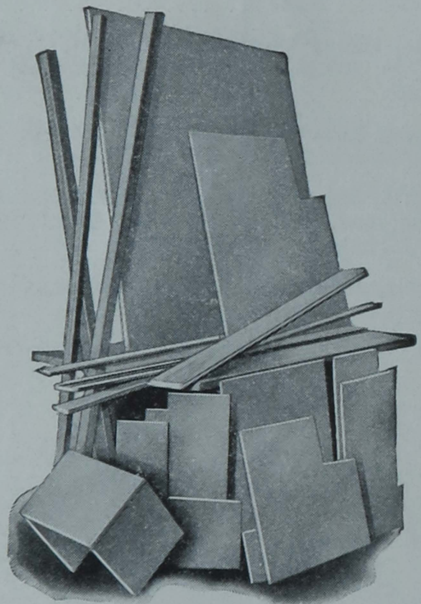


4M1

4M1 Asbestos Mill Board. A soft, fireproof board adapted for lining hoods, compartments, and also used as hotplate pads, etc. Supplied in standard sheets 42x48 inches.

Thickness, inches	⅛	3/16	¼	⅜	½
Weight per sheet, pounds	9	13.3	17.5	25.2	31.6
Pound (includes crating)	$ **.10**	**.10**	**.10**	**.10**	**.10**

4M2 Asbestos Mill Board. Same as 4M1, except cut to desired size. **Prices on application.**

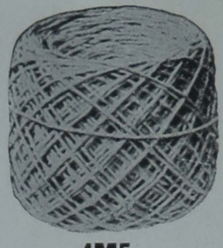


4M3

4M3 Asbestos Board, Transite. Fireproof building material composed of asbestos fibre and Portland cement, highly compressed. Not affected by water, alkalies, most acids or fumes. Sudden or extreme changes of temperature do not affect it in any way. It can be fastened with nails or screws and can be cut and worked with ordinary wood-working tools. It can also be painted, varnished or grained in true imitation of slate, marble or hard wood. Ideal for laboratory hoods, flues, table tops, etc. Can be furnished cut, fabricated and ready to be put up complete with angle irons or other supports at extra cost. Supplied in sheets, 42x48 inches.

Thickness, inches	⅛	3/16	¼	5/16	⅜	½
Wt., per sq. ft., lbs.	1.7	2.1	2.8	3.4	4	5.3
Square foot	$ **.20**	**.25**	**.30**	**.35**	**.40**	**.50**

4M4 Asbestos Cloth. In rolls 36 inches wide.
Lineal yard **$1.50**



4M5

4M5 Asbestos Cord. A fire and acid proof asbestos cord, ⅛-inch in diameter. Especially valuable for suspending metal retorts and crucibles in contact with fire and heat.
Pound **$1.25**

4M6 Asbestos Fibre. Thoroughly crushed, cleaned, screened and carded.

	Long fibre	Short fibre
Pound	**$ .15**	**.10**
100 pounds	**$4.00**	**2.65**

Asbestos Mittens, see page 208.

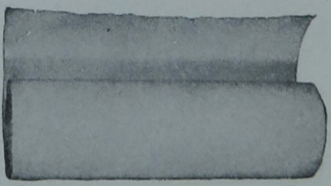
4M7

4M7 Asbestos Pads, Bound. For general laboratory use. Made of ⅛-inch thick asbestos board with all edges metal bound.

Size	**1**	**2**	**3**
Width, inches	6½	10	13
Length, inches	10	13	20
Each	**$ .60**	**.90**	**1.60**

Asbestos Pads, Square, Unbound. For general laboratory use.

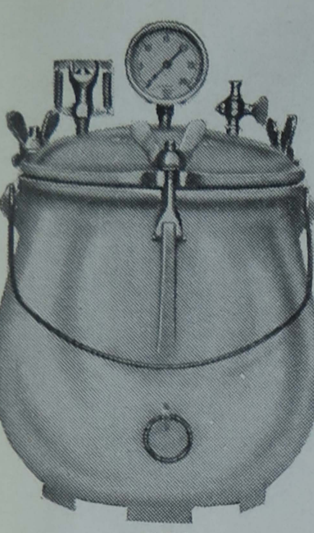
Side, inches	4	5	6	8
4M8 ⅛-Inch Thick, Dozen	**$ .35**	**.50**	**.50**	**.60**
4M9 ¼-Inch Thick, Dozen	**$ .40**	**.55**	**.65**	**.80**



4M10

4M10 Asbestos Paper. 1/64 inches thick; 36 inches wide. Weight, approximately 1½ pounds to the square yard.
Pound, $ .15. 10-pound lots, **pound** .... **$ .09**

Autoclaves

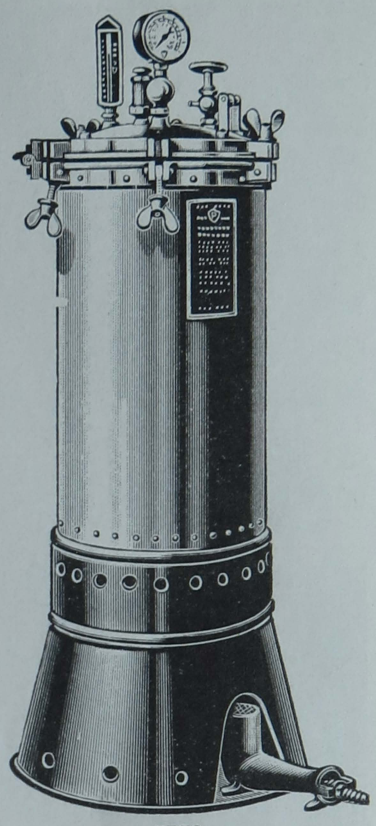


5M1

5M1 Autoclaves-Pressure Sterilizers. Made of heavy cast aluminum; will not rust. Supplied with 20-pound steam gauge and safety valve set and tested at 30 pounds pressure before leaving the factory. Regularly furnished without thermometer holder.

Size	**1**	**2**	**3**
Capacity, quarts	10	17	25
Diameter, top, inches	8	9½	10½
Diameter, greatest, inches	10	11½	12¾
Depth, inches	10	12	14
Weight, shipping, pounds	12	19	21
Each	**$15.00**	**21.00**	**27.00**

5M2 Thermometer Holders as additional equipment. **Extra** . . . **$1.00**



5M3

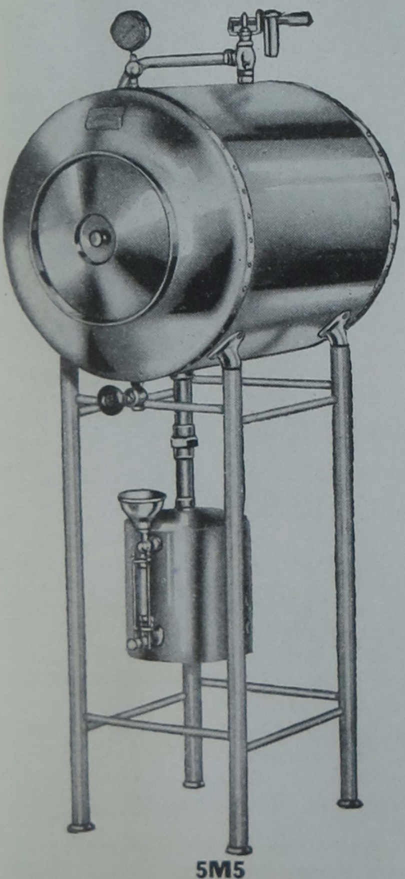
Autoclaves-Digesters. Apparatus for sterilization under steam pressure. Boiler is made of heavy polished copper, tinned inside, with lid of heavy cast brass, nickel plated and fitted with steam tight, ground-in beveled joint, no washer being necessary to make it steam tight. Apparatus is tested to 50 pounds pressure and guaranteed to stand a pressure of 35 pounds to the square inch. Provided with pressure gauge reading to 50 pounds in 1-pound subdivisions. Thermometer indicates temperature to 150° C. in 2° divisions. Safety valve set and sealed to release steam pressure after it reaches 30 pounds. Mounted on sheet iron base to protect flame.

5M3 Autoclaves-Digesters, Gas Heated. Supplied with suitable burner. **When ordering specify kind of gas.**

Size	**1**	**2**	**3**
Diameter, inches	8	11	14
Height, inside, inches	12	24	26
Height, overall, inches	30	44	46
Number of shelves	1	2	2
Each	**$60.00**	**87.00**	**120.00**

5M4 Autoclaves-Digesters, Electrically Heated. Same as 5M3, except electrically heated. Furnished for either 110 or 220 volts. Complete with 5 feet of cord and a three-way switch. **When ordering, specify current characteristics.**

Size	**1**	**2**	**3**
Watts	660	1650	2000
Each	**$82.00**	**118.00**	**157.00**



5M5

Autoclaves-Pressure Sterilizers, Horizontal. For rapid sterilization in steam under pressure. Used in hospitals, bacteriological laboratories, etc. Consists of a horizontal heavy copper outside cylinder with a double wall. Interior wall jacket is constructed of heavy polished Monel metal permanently closed at one end and closed at the other end by a circular heavy cast brass door having a ground edge fitting closely against a ground seat. When door is closed, the slightest internal pressure seals it hermetically without use of gaskets or packing and prevents scalding of the operator by opening the door before the pressure has been entirely relieved. The door is without hinges or mechanical fastenings of any kind and rolls sideways out of position on a cast brass track inside the sterilizer. In the absence of internal pressure, the door may be opened or closed by a touch of a finger. A safety valve set to relieve at 16 pounds pressure and a pressure gauge are situated on the top of sterilizer. In addition, an armored type thermometer is attached—range, 40° to 140° C. in single degrees. A globe valve located underneath the front of the sterilizer furnishes a means for evacuating the air and should not be closed until a steady stream of steam appears. The sterilizer is supported at a convenient height on a white enameled stand and is heated by steam produced in a generator suspended between the legs of the support and connected to the sterilizer by a steam pipe. The heat necessary for generating the steam is supplied by gas, electricity, or pressure steam, circulating through a closed coil. A glass water gauge for observing the level of the water in the generator, a funnel for filling and a drain cock are attached to the generator. The steam from the generator circulates through the jacket into the inner chamber insuring uniform temperature according to the pressure.

Size	**1**	**2**	**3**	**4**
Diameter, inside, inches	16	20	22	26
Diameter, door opening, inches	10	12	14	16
Length, inside, inches	20	24	28	32
Floor space required, inches	17x22	21x28	23x32	27x36
Current consumption, maximum watts, electrically heated autoclaves	2000	4000	4000	5000
5M5 Autoclaves, Gas Heated, Burnished Copper Finish	**$273.00**	**334.00**	**398.00**	**447.00**
5M6 Autoclaves, Gas Heated, Nickel Plated Finish	**$315.00**	**395.00**	**464.00**	**532.00**
5M7 Autoclaves, Steam Heated, Burnished Copper Finish	**$273.00**	**334.00**	**398.00**	**447.00**
5M8 Autoclaves, Steam Heated, Nickel Plated Finish	**$315.00**	**395.00**	**464.00**	**532.00**
5M9 Autoclaves, Electrically Heated, Burnished Copper Finish*	**$323.00**	**398.00**	**468.00**	**518.00**
5M10 Autoclaves, Electrically Heated, Nickel Plated Finish*	**$365.00**	**457.00**	**535.00**	**597.00**

5M11 Constant Evacuation Jet as additional equipment. **Extra** . . . **$35.00**

*When ordering specify current characteristics.

Balances, Assay, Heusser

Balances, Assay, Heusser, All-Metal Construction. Since metal is immune from the effect of weather variations, the cases neither shrink, swell, crack nor warp. They are handsomely and durably finished in Duco.

Beams are made of light-weight, but strong Duralumin. This metal retains a bright and durable polish, and resists corrosion. Standard beams are divided into 100 divisions on the weighing (right-hand) side. Upon the equilibrating (left-hand) side is engraved the word "Equilibrate." Weighing-riders indicate their own position upon the divisions of the beam. Beams having 100 divisions to the left-hand side of the pointers, and 100 divisions to the right-hand side, are special, but are supplied at the same price when so ordered.

The unit base and the releasing mechanism form a compact unit, combining and holding in exact position all the component balance parts. Large and recessed wearing surfaces retain ample lubrication and thereby provide long life for these movable parts.

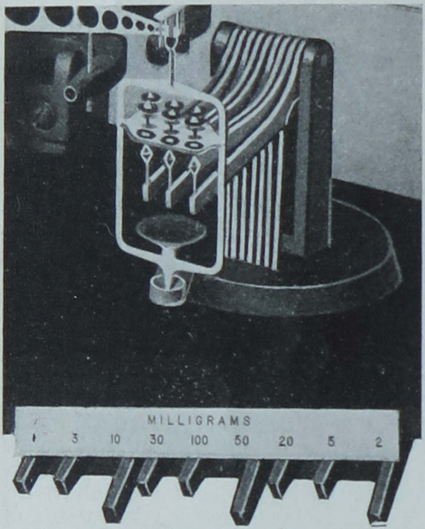
Edges are made of semi-precious, extra hard metal. When at rest edges and agate bearings are separated by a small air gap. A strong, soldered-link, brass chain replaces the old time weak door strings of the sliding door counter weights.

The customary and standard diameter of the black weighing pans is ¾ inches. For silver balances, 1-inch diameter, black weighing pans, with suitably larger hangers, may be supplied at no extra cost when so ordered.

Included with all balances are three 1-mg. or ½-mg. riders, black weighing pans, adjustable wrench, instructions and cost of domestic packing. Add $8.00 for encasing in zinc for ocean shipment.

Deflection of Pointer Over Index Scale

Variation of Weight	Deflection Without Load	Deflection With Load	Load	Sensitivity
$^{1}/_{10}$ mg.	1 division	1 division	2 grams	$^{1}/_{100}$
$^{1}/_{10}$ mg.	2 divisions	2 divisions	2 grams	$^{1}/_{200}$
$^{1}/_{10}$ mg.	3 divisions	3 divisions	2 grams	$^{1}/_{300}$
$^{1}/_{10}$ mg.	4 divisions	4 divisions	2 grams	$^{1}/_{400}$
$^{1}/_{10}$ mg.	5 divisions	5 divisions	2 grams	$^{1}/_{500}$



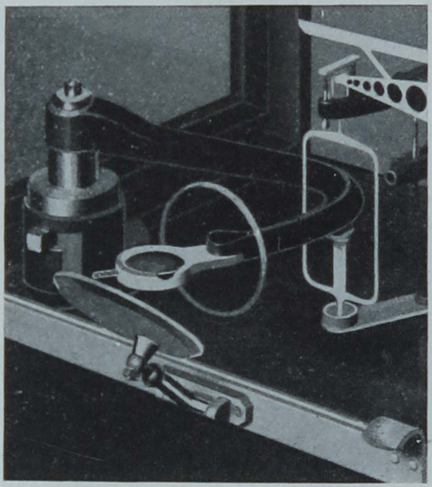
Keyboard Operated Multiple Weight Attachment

The keyboard operated multiple weight attachment is a labor-saving and accuracy-promoting weighing device which eliminates tedious tasks of hand-picking and hand-placing small weights into the weighing pan.

The weights are in the form of centrally perforated discs similar to washers, and rest on top of small cones registering with corresponding receptacles in a grid attached to the hanger. Raising the key picks the weight up. Weights may be deposited or picked up while the balance beam is free to swing.

The illustration shows six levers in their uppermost position, with the weights at rest, and three levers in their lowermost position, with their weights deposited upon the grid.

The capacity of the weights is 221 milligrams for assay balances and divided as follows: 1, 2, 3, 5, 10, 20, 30, 50 and 100 milligrams. For extremely delicate weighings where the ½-milligram rider is used, the capacity is only 121½ milligrams, divided as follows: ½, 1, 2, 3, 5, 10, 20, 30 and 50 milligrams. Since the greater number of buttons will come within this range, the handling of weights with tweezers is practically eliminated.

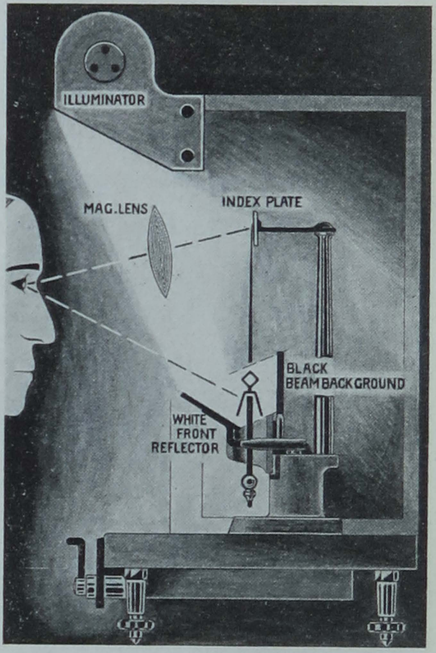


Mechanical Pan Extractor

The mechanical pan extractor serves the purpose of reducing the weighing time and increasing the accuracy of the weighings. For placing the gold or silver "Button" into the weighing pan and again removing it therefrom, it is necessary only to manipulate the knob shown at the bottom on the left-hand side of the balance casing. A slight rotary and backward motion of the knob brings the weighing pan outside of the balance casing ready to receive the gold or silver button. Reversing the order of these motions replaces the weighing pan upon the hangers. During these manipulations the balance door remains shut. The crystal shutter covering the round hole in the balance door opens and closes automatically with the motions of the knob. The illustration shows the crystal shutter open and the weighing pan outside of the balance casing.

The movement of this pan-extractor is very rapid, much faster than raising and lowering the whole balance door. The possibility of upsetting and damaging the hanger and the beam is positively and automatically prevented.

Since the balance door remains shut, disturbing air currents and dust can not interfere with the accuracy of the weighing results.



General Balance Illumination and Detailed Visibility

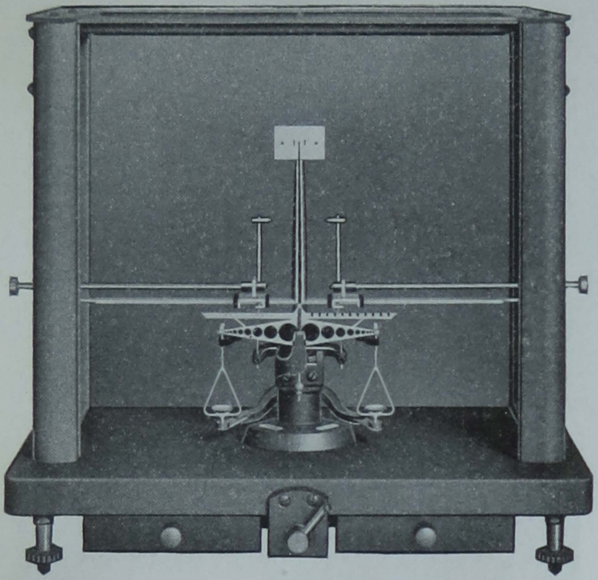
Heusser balances equipped with illuminator and magnifier are independent of daylight.

The all-metal construction of Heusser balances permits a continuous electrical illumination without interfering with the accuracy of the weighing. The visibility and ease for reading the rider position upon the beam-divisions may be enhanced further by placing a black background immediately behind the beam and by specially reflecting the light of the illuminator upon the beam divisions by means of a special white beam reflector.

The three-inch diameter index magnifier increases the visibility of the index pointer.

6M1 Illuminator. Each	**$22.50**
6M2 Illuminator. When furnished with balance. **Extra**	**$20.00**
6M3 Index Magnifier and Mounting. Complete	**$10.00**
6M4 Black Beam Background and White Front Reflector	**$5.00**

Balances, Assay, Heusser, Continued

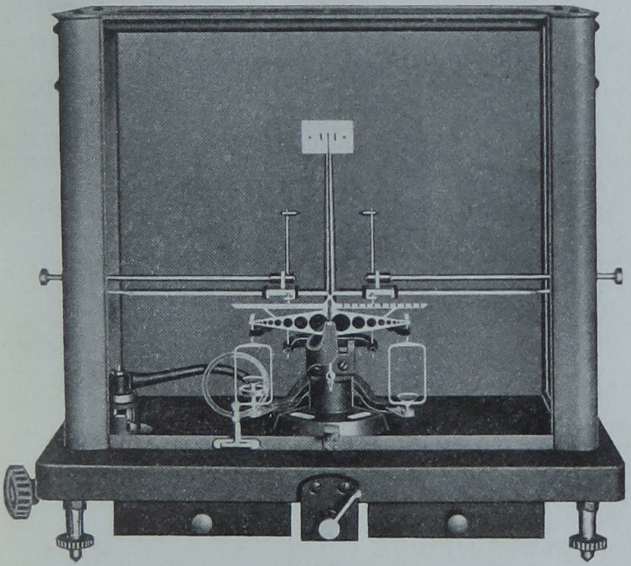


7M1

7M1 Balances, Assay, Heusser, Group A. Incorporates all of the basic features of Heusser Balances described on page 6. Size of balance casing, 18x10x18 inches. Length of beam, 5 inches. Net weight, 35 pounds. Shipping weight, 75 pounds. Export weight, 155 pounds.

Sensitivity, mg.	1/100	1/200	1/300	1/400	1/500
Used for	silver	silver	silver gold	gold	gold
Period of oscillation, seconds	3	4	5	6	7
Each	**$195.00**	**205.00**	**215.00**	**230.00**	**250.00**

Zinc Packing Case, for ocean shipment. **Extra** **$8.00**

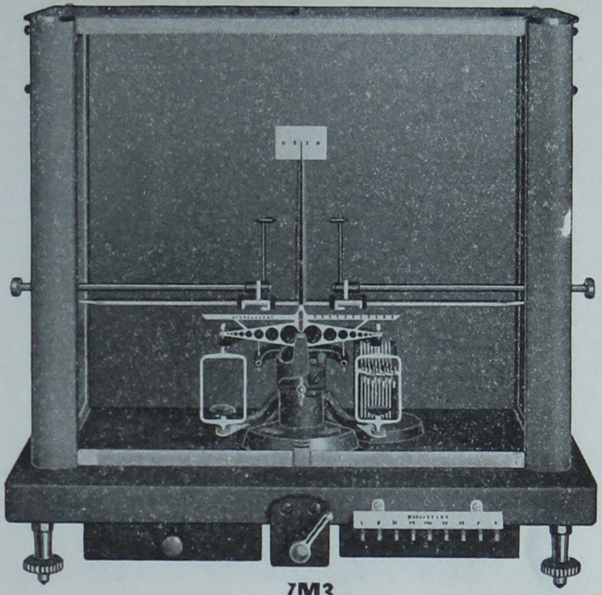


7M2

7M2 Balances, Assay, Heusser, Group AB. Same as 7M1, except includes mechanical pan extractor, described on page 6, for speed in loading and unloading the pans. Net weight, 35 pounds. Shipping weight, 75 pounds. Export weight, 155 pounds.

Sensitivity, mg.	1/100	1/200	1/300	1/400	1/500
Used for	silver	silver	silver gold	gold	gold
Period of oscillation, seconds	3	4	5	6	7
Each	**$295.00**	**305.00**	**315.00**	**330.00**	**350.00**

Zinc Packing Case, for ocean shipment. **Extra** **$8.00**



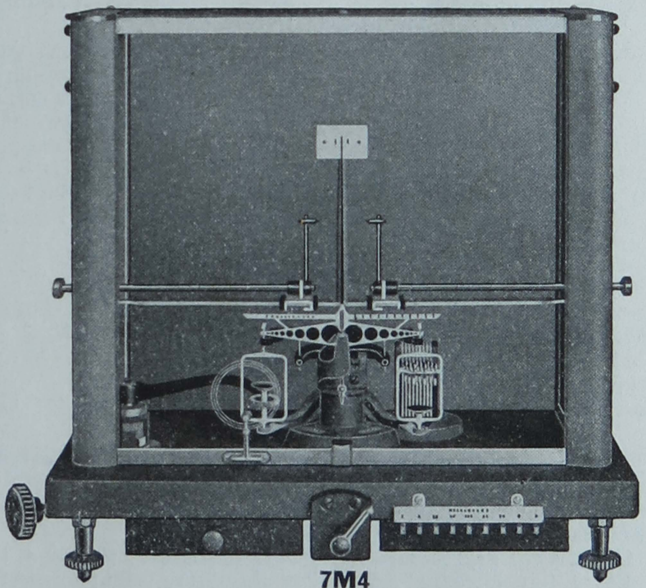
7M3

7M3 Balances, Assay, Heusser, Group C. Same as 7M1, except includes the keyboard operated multiple weight attachment, described on page 6, for faster weighing. Net weight, 35 pounds. Shipping weight, 75 pounds. Export weight, 155 pounds.

Sensitivity, mg.	1/100	1/200	1/300	1/400	1/500
Used for	silver	silver	silver gold	gold	gold
Period of oscillation, seconds	3	4	5	6	7
Each	**$335.00**	**345.00**	**355.00**	**370.00**	**390.00**

½ mg. riders and disc weights available if specified on order.

Zinc Packing Case, for ocean shipment. **Extra** **$8.00**



7M4

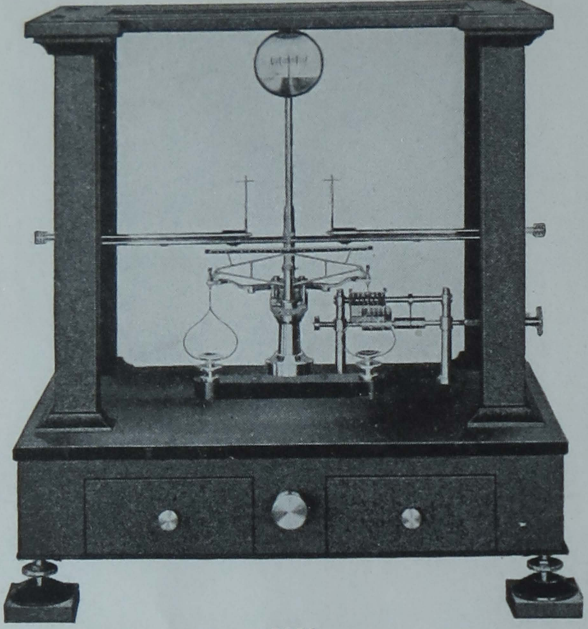
7M4 Balances, Assay, Heusser, Group D. Same as 7M1, except includes the mechanical pan extractor and the keyboard operated multiple weight attachment described on page 6. Net weight, 35 pounds. Shipping weight, 75 pounds. Export weight, 155 pounds.

Sensitivity, mg.	1/100	1/200	1/300	1/400	1/500
Used for	silver	silver	silver gold	gold	gold
Period of oscillation, seconds	3	4	5	6	7
Each	**$435.00**	**445.00**	**455.00**	**470.00**	**480.00**

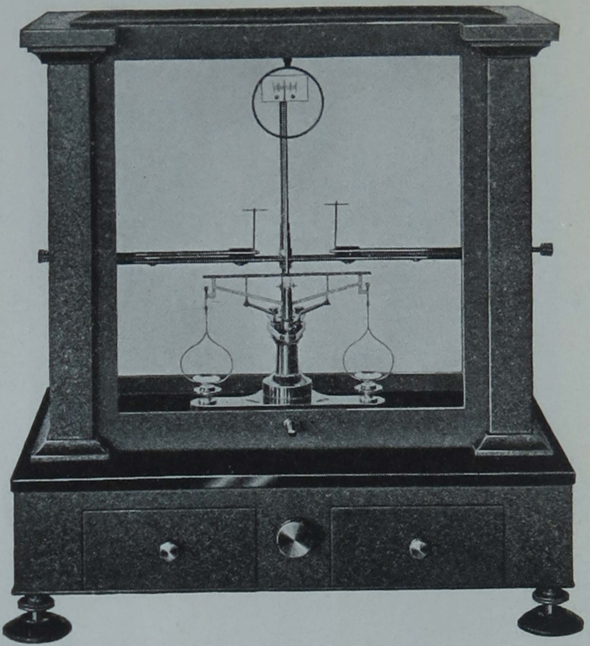
½ mg. riders and disc weights available if specified on order.

Zinc Packing Case, for ocean shipment. **Extra** **$8.00**

Balances, Assay, Ainsworth



8M1



8M4

8M1 Balances, Assay, Ainsworth, Type VMA. Capacity, 1 gram.

Beam, 5 inches long, hard rolled aluminum alloy with rider bar divided into 100 parts each side of center, each division representing .01 milligram when using a 1-milligram rider. Rider bar is attached to beam at center only, which prevents any temperature changes to be transmitted to the beam.

Edges and planes, hard, clear agate; with polished agate contact cups engaging rhodium plated contact points on releasing yoke.

Hangers, aluminum skeleton construction, very light and non-corrosive. Pans, aluminum.

Rider carriers, with no metal to metal sliding contacts. Sets rider squarely on beam and may be operated rapidly without "throwing" rider.

Releasing mechanism, with yoke for raising stirrups, which releases all contacts when beam is at rest. Rhodium points engage agate cups in stirrups, thereby affording frictionless contacts. Pan arrests and stirrups are released simultaneously, then the beam.

Finish of all metal work heavily gold plated with exception of rider rods, which are rhodium plated, and the column base, which is black baked-on lacquer.

Case, aluminum, black finish. With counterpoised sliding door, black Carrara glass base and four leveling screws. Width, 16 inches; height, 16 inches; depth, 10 inches.

Multiweight Carriers. Increases speed of weighing. Avoids handling of fractional weights. Carries individual milligram weights, 1, 2, 3, 5, 10 and 20 and permits weighings up to 42 milligrams with case closed.

Each weight is carried on an arm bearing a number corresponding with weight, from which it is transferred to a cross bar attached to stirrup by means of a sliding operating rod which extends through right end of case. To transfer a weight to cross bar, operating rod is moved longitudinally until number corresponding to weight to be shifted stands opposite indicator, when a slight turn shifts weight from carrier arm to cross bar, which is suspended from stirrup. When through weighing, a glance at numbers on arms that are down indicates combined weight of weights on bar. A slight turn resets all weights simultaneously.

Weight, shipping, 60 pounds. Complete with two 1-milligram beam riders and set of carrier weights but without cylindrical reading glass.

Sensitivity, milligrams	1/200	1/300	1/500
Period of oscillation, seconds	5	6	7
Each	**$275.00**	**300.00**	**325.00**

8M2 Balances, Assay, Ainsworth, Type VM. Same as 8M1, except without multiweight carrier. With two 1-milligram beam riders.

Sensitivity, milligrams	1/200	1/300	1/500
Period of oscillation, seconds	5	6	7
Each	**$225.00**	**250.00**	**275.00**

8M3 Cylindrical Reading Glass. For beam of 8M1 or 8M2. **Extra** **$25.00**

Ainsworth Assay Balances

Deflection of Pointer over Index Scale

Variation of Weight	Deflection	Degree of Sensitivity
8/100th mg.	10 divisions	1/500th mg.
1/10th mg.	7½ divisions	1/300th mg.
1/10th mg.	5 divisions	1/200th mg.

8M4 Balances, Assay, Ainsworth, Type VG.

Capacity, 1 gram. Sensitivity, 1/200 milligram. Period of oscillation, 5 seconds.

Beam, 5 inches long, hard rolled aluminum, divided into 50 parts each side of center, each division representing .02 milligrams when using a 1-milligram rider, or .01 milligram when using a .5 milligram rider.

Edges, hard, clear agate, highly polished. Stirrup agates, hard, clear agate, grooved and polished.

Hangers, skeleton construction and very light.

Rider carrier, with no metal to metal sliding contacts; sets rider squarely on beam and may be rapidly operated without "throwing" rider.

Releasing mechanism is constructed such that the pan arrests fall away first, followed by beam supports. Stirrup agates are grooved and remain in contact with the end edges, but center edge is raised from the center bearing when the beam is brought to rest.

Finish is baked-on lacquer, with the exception of rider rods which are rhodium plated.

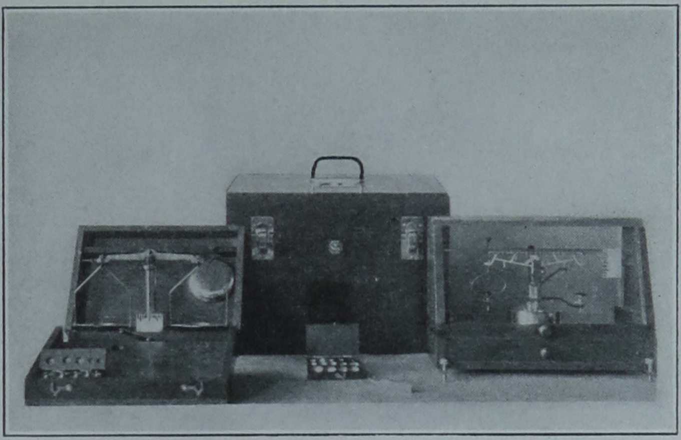
Case, aluminum, black finish. With counterpoised sliding door, black Carrara glass base and four leveling screws. Width, 16 inches; height, 16 inches; depth, 10 inches.

Weight, shipping, 60 pounds. Complete, with two 1-milligram beam riders. Without cylindrical reading glass. **Each** . . **$175.00**

8M5 Cylindrical Reading Glass. For beam of 8M4. **Extra** **$25.00**

Note: For packing balance in zinc case for ocean shipment, **add $8.00.**

Balances, Assay, Continued



9M1

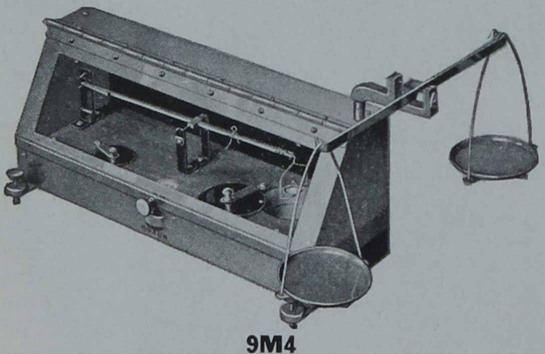
9M1 Balance Outfits, Portable. For field assays. Consists of an assay balance, a pulp balance, and weights.

Assay Balance	Pulp Balance
Sensitivity, $^1/_{100}$th milligram.	Capacity, 150 grams.
Period of oscillation, 12 seconds.	
Beam, 5 inches long; of hard-rolled aluminum alloy. Graduated on each side in 50 divisions. With ½-milligram rider.	Sensitivity, 1 milligram.
Pans, nickel silver oxidized black.	Beam, 5 inches long; brass.
Releasing mechanism, fall away type.	
Knife edges and bearings, agate.	Pans, 2½ inches in diameter.
Hangers, nickel silver.	
Pointer, at the right end of beam in a direct line with the knife edges.	Bearings, agate.
Weights, $^1/_{10}$ milligram to 1 gram of tantalum, Class S.	Weights, $^1/_{20}$ to 1 assay ton.

Complete in carrying case, 12½x11½x6 inches; weight, 9½ pounds. **Each**..$180.00

9M2 Balances, Assay, Portable. Consists only of the portable assay balance contained in 9M1 outfit. Carrying case dimensions are 12½x8½x6 inches. Weight is 5½ pounds. Complete, with set of weights $^1/_{10}$ milligram to 1 gram of tantalum. **Each**..**$165.00**

9M3 Balances, Pulp, Portable. Consists only of the portable pulp balance contained in 9M1. Complete, with set of weights $^1/_{20}$ to 1 assay ton. **Each**..**$18.00**



9M4

9M4 Balances, Combination Assay and Pulp, Portable. Particularly adapted for use where a small, portable and accurate balance is required.

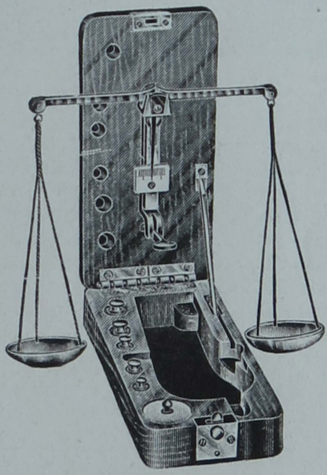
The pulp balance has a capacity of 30 grams; a sensitivity of 1 milligram.

The button balance will weigh buttons up to 5 milligrams with an accuracy of $^1/_{100}$th milligram. It measures 8⅝x2¾ inches on the base; 3½ inches high.

The moving parts of both balances can be assembled or dismounted quickly and conveniently. Carrying places for the moving parts and the weights are provided in the balance case for their protection.

Weight of the combination balance, together with the weights, is 2 pounds.

Complete, with weights. **Each**....................**$47.50**



9M5

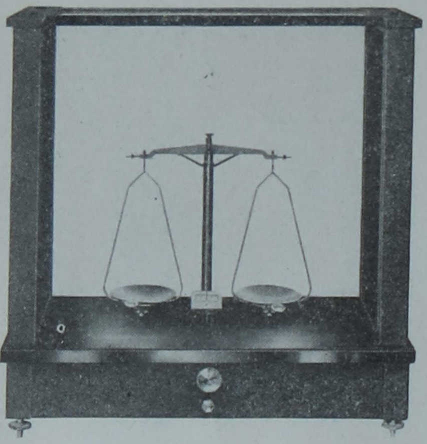
9M5 Balances, Assay, Pocket. Lid is raised and lowered by means of a drop lever which remains in position until released.

Capacity, 10 grams.

Sensitivity, 1 milligram.

Complete with weights, 1 milligram to 10 grams, neatly fitted in box as illustrated. Dimensions of box when closed: length, 6 inches; width, 2¾ inches; height, 1¼ inches. **Complete**..**$12.00**

Balances, Pulp



10M1

10M1 Balances, Assay, Pulp, Ainsworth, Type M.

Capacity, 200 grams in each pan.

Sensitivity, 0.5 milligram.

Beam, 6 inches long.

Edges, steel.

Planes, agate.

Hangers equipped with 3-inch pans.

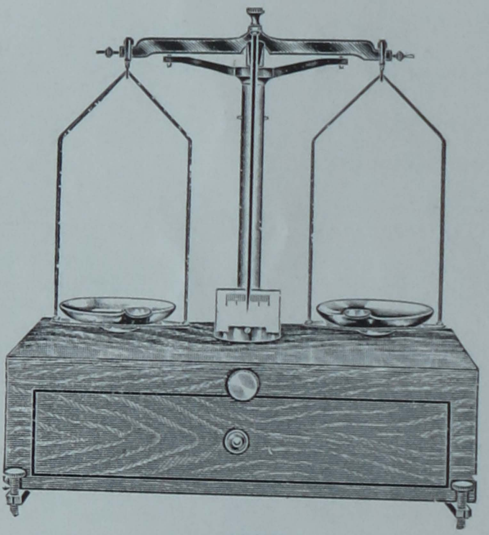
Case, aluminum, finished in black crystallized lacquer. With four leveling screws and a slate base. Counterpoised front door and removable rear door. Width, 18 inches; height, 18 inches; depth, 9 inches.

Weight, shipping, 55 pounds.

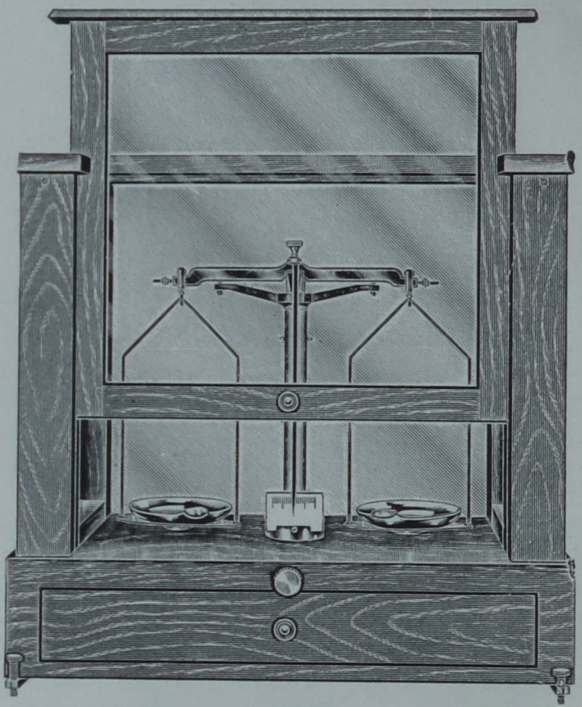
Each **$60.00**

10M2 Balances, Assay, Pulp, Ainsworth, Type M. Same as 10M1, except with agate edges. **Each** **$65.00**

Zinc Packing Case, for ocean shipment. **Extra** **$8.00**



10M3



10M4

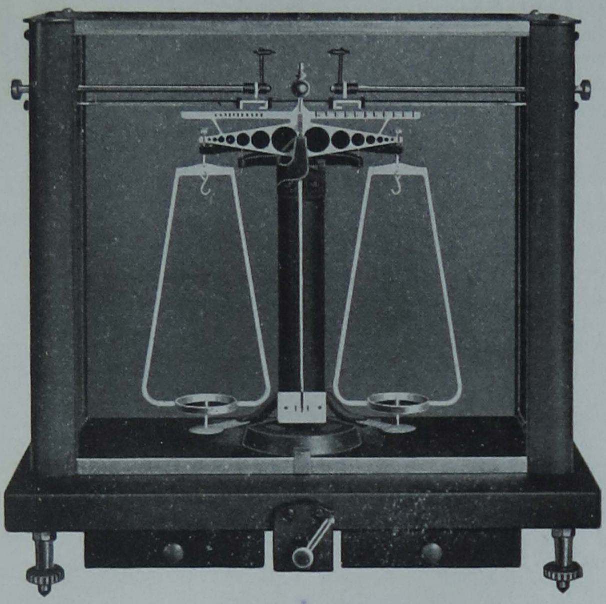
10M3 Balances, Pulp. Steel knives, agate bearings, brass parts highly polished and lacquered. Furnished with level and leveling screws and nickel-plated removable pans. On mahogany box with drawer.

Capacity, grams	**75**	**150**	**300**	**600**	**1500**	**3000**
Capacity, ounces	2	5	10	20	50	100
Sensitivity, mg.	1	2	5	5	10	25
Sensitivity, grains	.01	.03	.07	.07	.15	.38
Pans, diameter, inches	2¾	3¼	4	5	6	7
Box, length, inches	12	12	14⅝	17	18	22
Box, width, inches	6	6	8	8½	10	11
Box, height, inches	3⅜	3⅜	3½	4½	4¼	5
Beam, length, inches	7	7	9¼	10½	11¼	14¼
Beam, length, mm.	178	178	235	267	286	368
Each	**$24.00**	**25.00**	**32.00**	**37.00**	**47.00**	**92.00**

10M4 Balances, Pulp. Same as 10M3, except mounted in mahogany and glass case with front door counterpoised.

Capacity, grams	**75**	**150**	**300**	**600**	**1500**	**3000**
Capacity, ounces	2	5	10	20	50	100
Sensitivity, milligrams	1	1	2	5	10	10
Sensitivity, grains	.01	.01	.03	.07	.15	.15
Pans, diameter, inches	2¾	3¾	4	5	6	7
Box, length, inches	16	16	20	21	23	29
Box, width, inches	7½	7½	9½	10	11	13
Box, height, inches	14¾	14¾	18¼	21	23	27
Beam, length, inches	7	7	9¼	10½	11¼	14½
Beam, length, millimeters	178	178	235	267	286	368
Each	**$36.00**	**39.00**	**52.00**	**62.00**	**82.00**	**132.00**

Balances, Analytical, Heusser



11M1

11M1 Balances, Analytical, Heusser, Group F. A standard analytical balance, substantially built and accurate. Suitable for the most exacting requirements. It has numerous improvements over earlier types, namely: the single-piece, direct-reading beam is made of Duralumin (aeroplane metal). This metal is much stronger than brass and three times lighter. It retains a bright and durable polish and resists corrosion much better than gold-plated brass. The divisions are offset from the center line of the beam. This feature of splitting the zero line and shifting the lines on both sides from the center of the beam, so as to have two zero marks and two riders, is an improvement over the method of having only one zero line and one zero mark in the center of the beam and makes for speed and accuracy in weighing. One of the riders serves the purpose of equilibrating the swinging system which consists of beams, hangers and pans.

Capacity, 200 grams.

Beam, 6¼ inches long (159 mm.).

Edges, made of indestructible stellite, an ideal material for edges because it is exceedingly hard, less brittle than agate and resists corrosion under all conditions.

Hangers, skeleton construction, possessing maximum strength with minimum weight. This construction permits the use of weighing pans of different shapes and sizes.

Bearings, flat agates. Contact with the edges only when the beam is released.

Rider Carrier, improved design. The slides are molded Bakelite, insuring smooth action without the need of lubrication.

Releasing Mechanism, of sturdy construction, for the hangers and the beam. Single action front lever releasing arrangement. Turning the front lever counter clockwise releases successively the hangers and the beam.

Casing, all metal, with counterpoised front door, handsomely and durably finished in Duco or its equivalent. Dimensions: 18x10x18 inches.

Illuminator, not regularly furnished, but can be ordered separately.

Weight: net, 35 pounds; shipping, 65 pounds.

Complete with three 10 mg. weighing riders, 2 weighing pans, adjusting wrench, instructions, and domestic packing.

Sensitivity, mg.	1/10	1/25	1/50	1/100
Each	**$180.00**	**185.00**	**190.00**	**200.00**

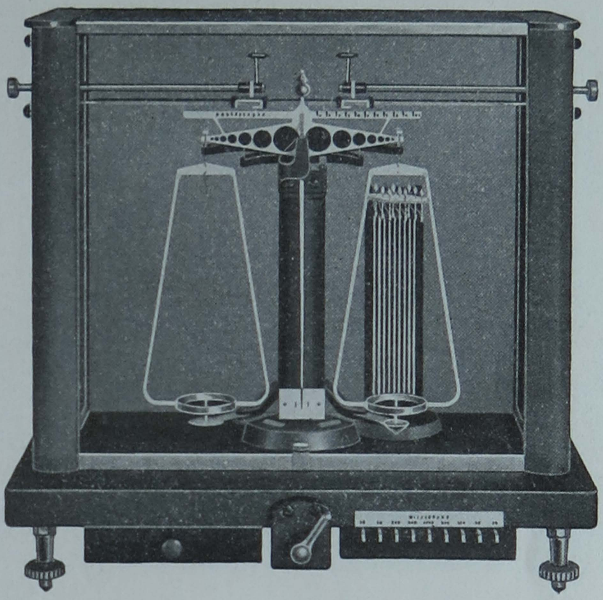
11M2 Illuminator. For 11M1 as described on page 6. Standard wiring, 110 volts.

Extra when furnished with balance.................. **$20.00**

Zinc Packing Case, for ocean shipment. **Extra**...... **$8.00**

Balance Repairs

Repair of Assay and Analytical Balances handled efficiently and promptly.



11M3

11M3 Balances, Analytical, Heusser, Group G. Same as 11M1, except with addition of the Heusser Multiple Weight Attachment. This attachment has nine weights, 10, 20, 30, 50, 100, 200, 300, 500 and 1000 mg., a total of 2210 mg. The value of the active weights deposited upon the hanger is clearly indicated by a figure plate above the keyboard located in front of the balance. Weights may be added or subtracted while the beam is swinging. The smallest weight to be handled with tweezers is therefore 2 grams.

Capacity, 200 grams.

Beam, 6¼ inches long (159 mm.). Made of hard rolled Duralumin (aeroplane metal). Black divisions upon a bright surface.

Edges, made of indestructible stellite, an ideal material for edges, because it is exceedingly hard, less brittle than agate and resists corrosion under all conditions.

Bearings, flat agate. Separated from the edges when the beam is at rest.

Rider Carrier, improved design. Slides are molded Bakelite so that there is no metal to metal sliding contact. The riders may be manipulated rapidly without danger of "throwing" them.

Releasing Mechanism, of sturdy construction, for the hangers and the beam. Turning the front lever counter-clockwise releases successively the hangers and the beam.

Casing is handsomely, durably finished. Dimensions: 18x10x18 inches. Small brass parts are substantially gold plated.

Illuminator, not regularly furnished, but can be ordered separately.

Weight: net, 35 pounds; shipping, 65 pounds.

Complete with three 10-mg. weighing riders, 2 weighing pans, adjusting wrench, instructions and domestic packing.

Sensitivity, mg.	1/10	1/25	1/50	1/100
Each	**$315.00**	**320.00**	**325.00**	**335.00**

11M4 Illuminator. For 11M3 as described on page 6. Standard wiring, 110 volts.

Extra when furnished with balance.................. **$20.00**

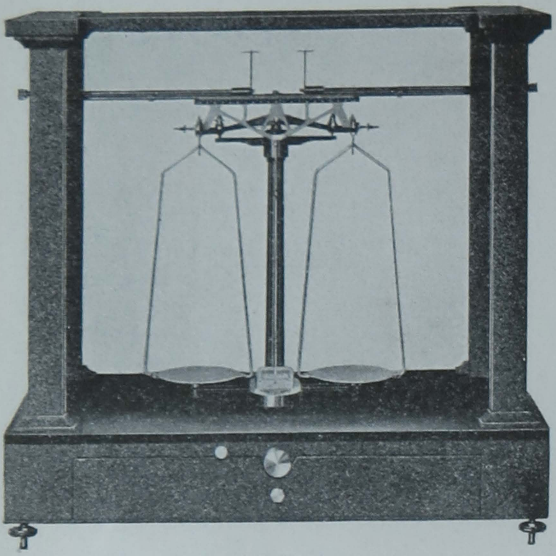
Zinc Packing Case, for ocean shipment. **Extra**..... **$8.00**

HEUSSER ANALYTICAL BALANCES

Deflection of Pointer Over Index Scale

Variation of Weight	Deflection Without Load	Deflection With Load	Load	Sensitivity
1 mg.	2 divisions	1 division	200 grams	1/10
1 mg.	4 divisions	3 divisions	200 grams	1/25
1 mg.	6 divisions	5 divisions	100 grams	1/50
1 mg.	11 divisions	10 divisions	50 grams	1/100

Balances, Analytical, Ainsworth



12M1

Balances, Analytical, Ainsworth.
Capacity, 200 grams.
Sensitivity, 1/40th milligram.

Beam, 6 inches long, hard rolled aluminum alloy, "profiled" from the solid slab, with edges of triangular shaped agate swaged into place. Graduated with 100 white divisions each side of zero center on black background.

Edges and planes, hard, clear, white agate.

Hangers, 4¼ inches wide at bows; 8 inches in height; with 3¼ inch diameter aluminum flanged plates.

Pans, two, nickel-plated, removable; 3 inches diameter.

Rider carriers, two, one for each side of beam. No metal to metal sliding contacts. May be moved rapidly without "throwing" rider. 10-milligram riders with square eyes can be set squarely on beam with ease.

Releasing mechanism so designed that when stirrup levers are raised while beam is swinging, stirrup will fall into yokes at ends of levers and planes will not be moved across edges. Adjustable pan arrests are operated by a button on the left of beam arrest knob.

Finish of all operating rods in releasing mechanism, stainless steel, including drop lever pivot pin; all parts heavily gold plated with exception of stirrup drop levers, which are black crystallized lacquer, and rider rods, rhodium plated.

Case, aluminum, black crystallized lacquer. With counterpoised front door and removable rear door, black Carrara glass base, spirit levels, and four leveling screws. Width, 20 inches; height, 18 inches; depth, 10 inches. Weight, shipping, 70 pounds.

12M1 Balances, Analytical, Ainsworth, Type T. With two 10-milligram beam riders. **Each**..**$200.00**

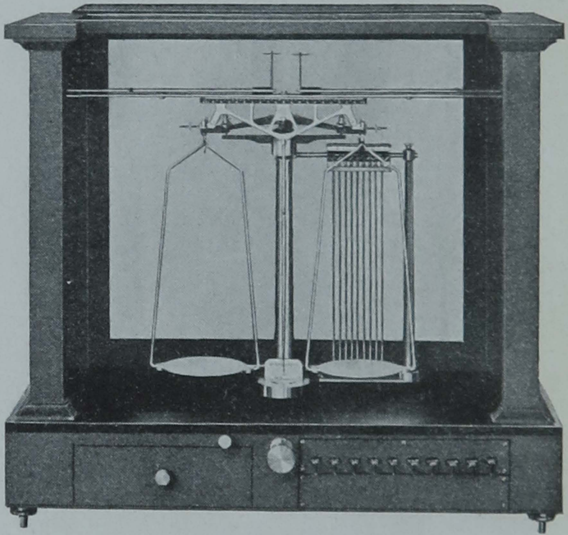
Zinc Packing Case, for ocean shipment. **Extra**..................**$8.00**

Keyboard Operated Weight Carrier. Increases speed of weighing. Avoids handling of all fractional weights, up to and including one gram. Total capacity, 2,220 milligrams. Each weight carried on arm bearing number corresponding to weight and connected with key on front of case. Depressing key transfers weight from arm to bar suspended from stirrup. Any combination of weights up to 2,220 milligrams may be used and a glance at arms or keys depressed shows total value of weights used. When through weighing, all weights are returned to their respective arms simultaneously by depressing the reset key. When weighing, any weight can be transferred to bar and, if found too heavy or too light, can be returned to its arm without resetting such other weights as may have been transferred previously. Weights can be transferred back and forth with beam in motion. Device uses individual weights that are units of mass. May be adjusted at any time against fundamental standards. Highest degree of precision can be attained and maintained at all times. Weights retain initial accuracy after years of constant use. Design incorporates minimum amount of area or surface exposed to collection of dust, etc.; not being handled, weights become neither bent nor broken. Weights from one gram to 50 milligrams are gold; from 30 to 5 milligrams, aluminum.

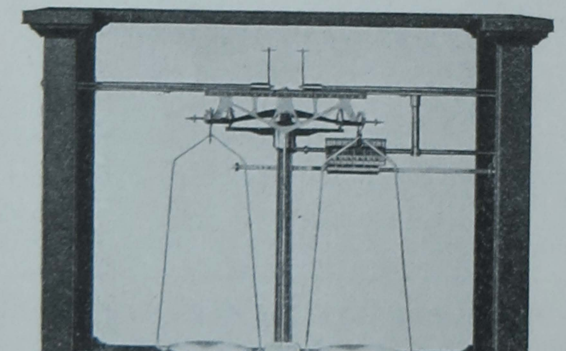
Weight, shipping, 75 pounds.

12M2 Balances, Analytical, Ainsworth, Type TC. Same as 12M1, except with keyboard operated weight carrier. With two 10-milligram beam riders and set of carrier weights. **Each**........................**$325.00**

Zinc Packing Case, for ocean shipment. **Extra**..................**$8.00**



12M2



12M3

Multiweight Carriers. Incorporates all advantages of the keyboard type, except in the method of operation, this type using a sliding bar operated from the right hand side of the case. To transfer a weight to cross-bar, operating rod is moved longitudinally until the number on the rod corresponding to the weight to be shifted stands opposite to the indicator, when a slight turn shifts the weight from the carrier arm to the crossbar which is suspended from the stirrup. When through weighing, a glance at the numbers on the arms that are down indicates the combined weight of the weights on the bar. A slight turn resets all weights simultaneously, or when weighing, any weight can be transferred to the bar, and, if found too heavy or too light, can be transferred back and forth with the beam in motion. Weight, shipping, 75 pounds.

12M3 Balances, Analytical, Ainsworth, Type TA. Same as 12M1, except with multi-weight carrier. With set of carrier weights and two 10-milligram beam riders. **Each**..............................**$275.00**

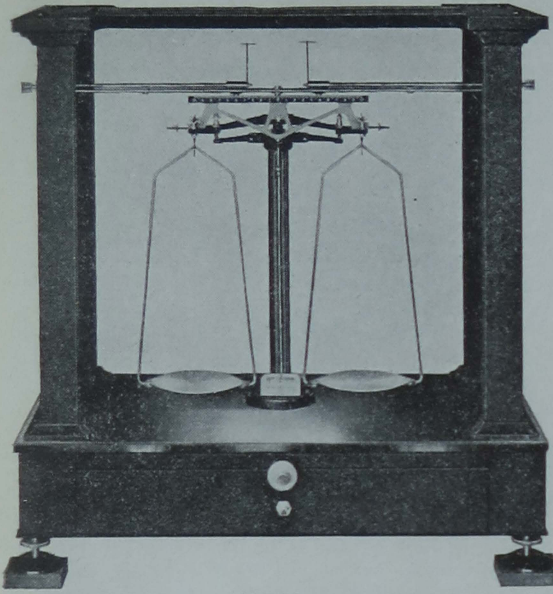
Zinc Packing Case, for ocean shipment. **Extra**..................**$8.00**

Ainsworth Analytical Balances

Deflection of Pointer over Index Scale

Variation of Weight	Deflection	Degree of Sensitivity
1 mg.	10 divisions	1/40th mg.
1 mg.	5 divisions	1/20th mg.
1 mg.	2½ divisions	1/10th mg.

Balances, Analytical, Ainsworth, Continued



13M1

Balances, Analytical, Ainsworth.

Capacity, 200 grams in each pan.

Sensitivity, 1/20th milligram.

Beam, 6 inches long, hard rolled aluminum alloy.

Edges and planes, hard, clear white agate.

Hangers, 4¼ inches wide at bows; 8 inches high; with 3¼ inches diameter aluminum flanged plates.

Pans, two, nickel plated, removable, 3 inches diameter.

Rider carriers, two, one for each side of beam. No metal to metal sliding contacts. May be moved rapidly without "throwing" rider. 10-milligram riders with square eyes can be set squarely on beam with ease.

Releasing mechanism so designed that when the stirrup levers are raised while the beam is swinging the stirrups will fall into the yokes at the ends of levers. Planes will not be moved across edges. Adjustable pan arrests are operated by a button in the center of the beam arrest knob.

Finish, with exception of stirrup support levers and column base, which are finished in crystallized black, is rhodium plated.

Case, aluminum, black crystallized lacquer. With counterpoised front door and removable rear door, black Carrara glass base, spirit levels and four leveling screws. Width, 18 inches; height, 18 inches; depth, 10 inches. Weight, shipping, 65 pounds.

13M1 Balances, Analytical, Ainsworth, Type B. With two 10-milligram beam riders. **Each**..**$150.00**

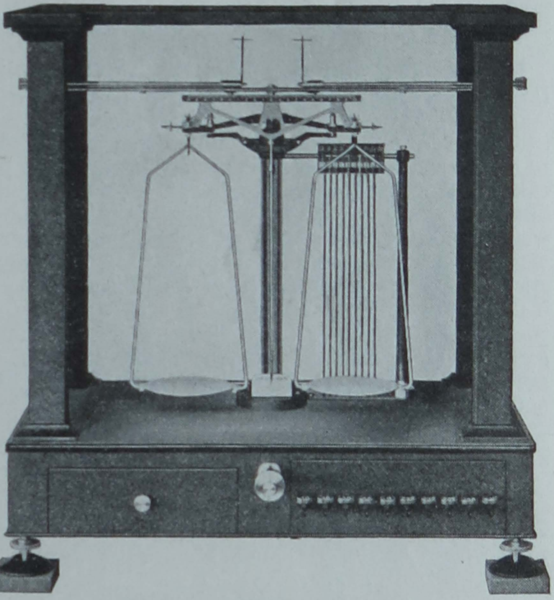
Zinc Packing Case, for ocean shipment. **Extra**..................**$8.00**

Keyboard Operated Weight Carrier. Increases speed of weighing. Avoids handling of all fractional weights up to and including one gram. Total capacity, 2,220 milligrams. Each weight carried on an arm bearing a number corresponding to weight and connected with a key on front of case. Depressing key transfers weight from arm to bar suspended from stirrup. Any combination of weights up to 2,220 milligrams may be used and a glance at arms or keys depressed shows total value of weights used. When through weighing, all weights are returned to their respective arms simultaneously by depressing reset key. When weighing, any weight can be transferred to the bar and if found too heavy or too light, can be returned to its arm without resetting such other weights as may have been transferred previously. Weights can be transferred back and forth with the beam in motion. Uses individual weights that are units of mass and which may be adjusted at any time against fundamental standards. The highest degree of precision can be attained and maintained at all times. Weights retain their initial accuracy after years of constant use. Design incorporates minimum amount of area or surface exposed to collection of dust, etc.; not being handled, weights do not become bent or broken. Weights from one gram to 50 milligrams, gold; 30 to 5 milligrams, aluminum.

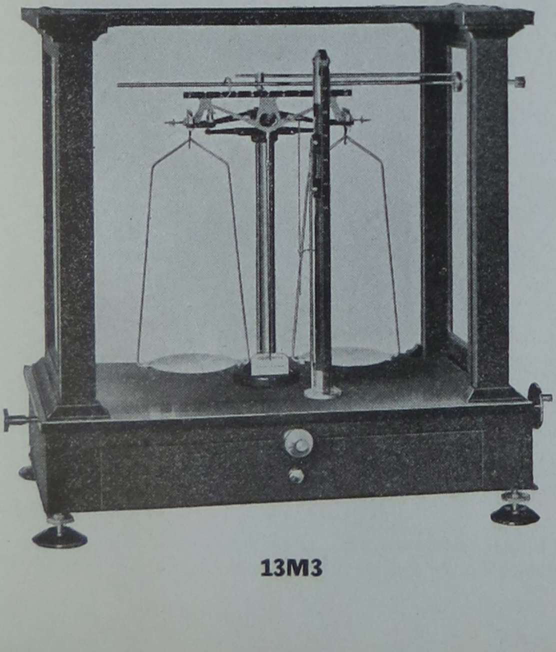
Weight, shipping, 75 pounds.

13M2 Balances, Analytical, Ainsworth, Type BT. Same as 13M1, except with keyboard operated weight carrier. With set of carrier weights, and two 10-milligram beam riders. **Each**......................**$275.00**

Zinc Packing Case, for ocean shipment. **Extra**..................**$8.00**



13M2



13M3

Chainweight Device. Operated by means of a flexible graduated tape instead of a movable vernier. Point at which the readings are taken is always at eye level. Two and one-half turns of the knob at right end of case moves the chain throughout its entire 100-milligram range.

Adjustable vernier enables the adjustment of the equilibrium by the correct method of using the chain. When this has been accomplished, the zero point is set by moving the vernier with the knob on the left end of the balance to agree with zero point on the graduated tape. Chain support on the beam is a frictionless type; uses a pivot and jeweled bearing.

Notched beam has ten notches numbered from zero at left to 10 at right, representing 0 to 1 gram according to the position of the beam weight which may be shifted from one end of the beam to the other by means of the carrier arm.

Combined capacity of the notched beam and chainweight feature is 1.1 grams, which renders unnecessary the use of all fractional weights.

Weight, shipping, 60 pounds.

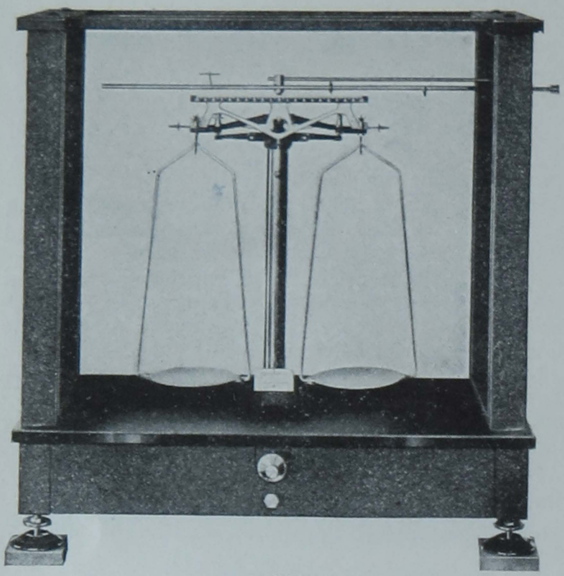
13M3 Balances, Analytical, Ainsworth, Chainweight, Type BB. Same as 13M1, except with chainweight and notched beam. **Each**......**$210.00**

13M4 Balances, Analytical, Ainsworth, Chainweight, Type BC. Same as 13M3, except without notched beam. **Each**..................**$200.00**

13M5 Balances, Analytical, Ainsworth, Type BCT. With keyboard operated carrier, same as 13M2, and chainweight feature, same as 13M4. These combined attachments handle all weights from 1 mg. to 2 grams and permit weighings up to 4.2 grams with the case closed. **Each**.....**$305.00**

Zinc Packing Case, for ocean shipment. **Extra**..................**$8.00**

Balances, Analytical, Ainsworth, Continued



14M1

Balances, Analytical, Ainsworth. Capacity, 200 grams. Sensitivity, 1/20th milligram.

Beam, 6 inches long, hard, rolled aluminum alloy, "profiled" from solid slab. Edges triangular shaped agate, swaged or driven into place, insuring permanent accuracy. Beam graduated with 100 white divisions each side of zero center on a black background.

Edges and planes, hard, clear white agate.

Hangers, 4¼ inches wide at bows; 8 inches high; with 3¼-inch diameter aluminum flanged plates. Pans, two, nickel-plated, 3 inches diameter, removable.

Rider carrier has one hook which serves both sides of beam. No metal to metal sliding contacts. May be operated rapidly without "throwing" rider. Using a 10-milligram rider with a square-eye, rider is set squarely on beam with ease.

Releasing mechanism accurately constructed with swinging stirrup support levers, pivoted in line with line of contact of center edge so that if beam is swinging, stirrups fall into yokes at ends of levers and planes will not be moved across edges.

Pan arrests, adjustable, operated by button in center of beam arrest knob.

Finish, stainless steel, wherever practical. Metal work is finished bright and protected with baked-on lacquer, with exception of stirrup support levers and column base which are finished in crystallized black.

Case, aluminum, black crystallized lacquer. With a counterpoised front door and a removable rear door, black Carrara glass base, spirit levels, and four leveling screws. Width, 18 inches; height, 18 inches; depth, 9 inches.

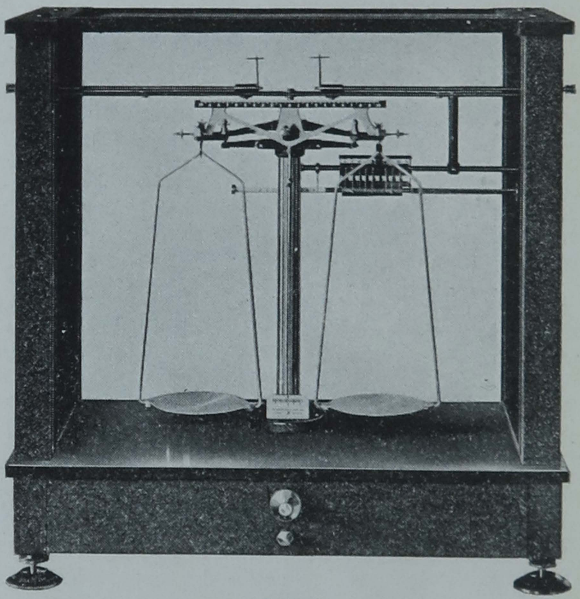
14M1 Balances, Analytical, Ainsworth, Type DL. With two 10-milligram beam riders. **Each**.......................................**$125.00**

Multiweight Carrier. Increases speed of weighing. Avoids handling of fractionals. Carries all fractional gram weights and permits weighing up to 2,220 milligrams with the case closed. Each weight is carried on an arm bearing a number corresponding with weight, from which it is transferred to a cross bar attached to stirrup by means of a sliding operating rod which extends through right end of case. To transfer a weight to the cross bar, operating rod is moved longitudinally until the number corresponding to the weight to be shifted stands opposite the indicator, when a slight turn shifts weight from the carrier arm to the cross bar, which is suspended from the stirrup. When weighing, any weight can be transferred to the bar, and, if found too heavy or too light, can be returned to its arm without resetting such other weights as may have been transferred previously. Weights can be transferred back and forth with the beam in motion. Design incorporates all the advantages named in the preceding types, giving increased speed in weighing, without the sacrifice of accuracy.

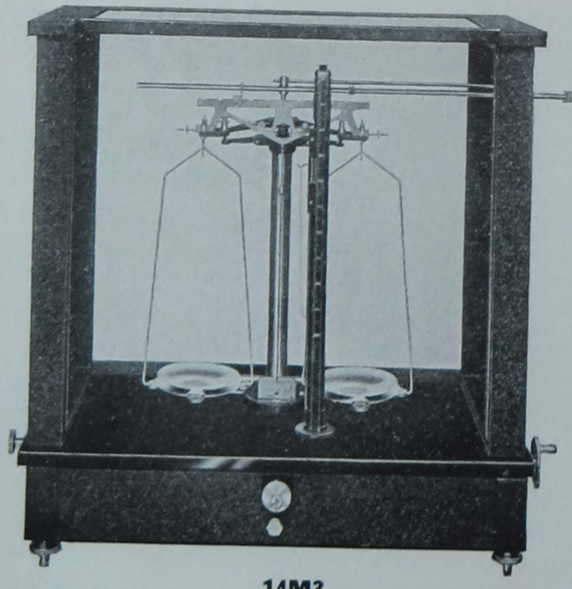
Weights from 1000 to 50 milligrams are gold; from 30 to 10 milligrams, aluminum.

Weight, shipping, 60 pounds.

14M2 Balances, Analytical, Type DLM. Same as 14M1, except with multiweight carrier. With set of carrier weights and two 10-milligram beam riders. **Each**.......................................**$185.00**



14M2



14M3

Chainweight Device. Operated by means of a flexible graduated metal tape instead of a movable vernier. Point at which the chainweight readings are taken is always at eye level. Two and one-half turns of the knob at right end of case moves the chain throughout its entire 100-milligram range. Entire chain driving mechanism is direct connected to insure positive drive—all friction drives have been eliminated.

Adjustable vernier enables the adjustment of the equilibrium by the correct method of using the chain. When this has been accomplished, the zero point is set by moving the vernier with the knob on the left end of the balance to agree with the zero point on the graduated tape.

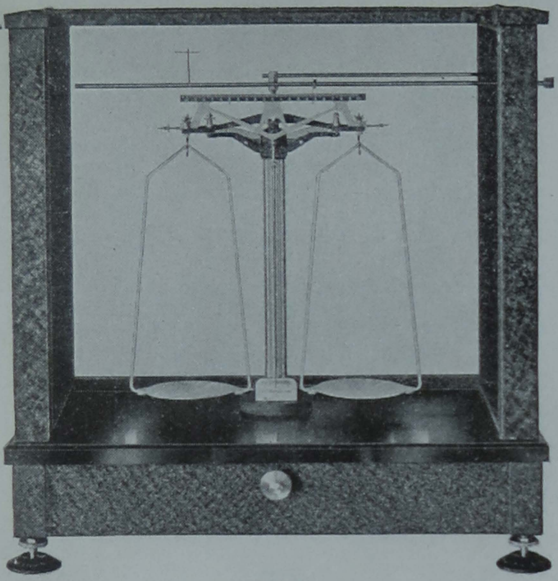
Chain support on the beam is of a frictionless type, using a pivot and jeweled bearing, which eliminates any possibility of the chain swinging with the beam, thus decreasing sensitivity.

Notched beam has 10 notches numbered from zero at left to 10 at right, representing 0 to 1 gram according to the position of the beam weight which may be shifted from one end of the beam to the other by means of the carrier arm. Combined capacity of the notched beam and chainweight feature is 1.1 grams, which renders unnecessary the use of all fractional weights.

14M3 Balances, Analytical, Ainsworth, Chainweight, Type DLB. Same as 14M1, except with chainweight device and notched beam. **Each**.......................................**$180.00**

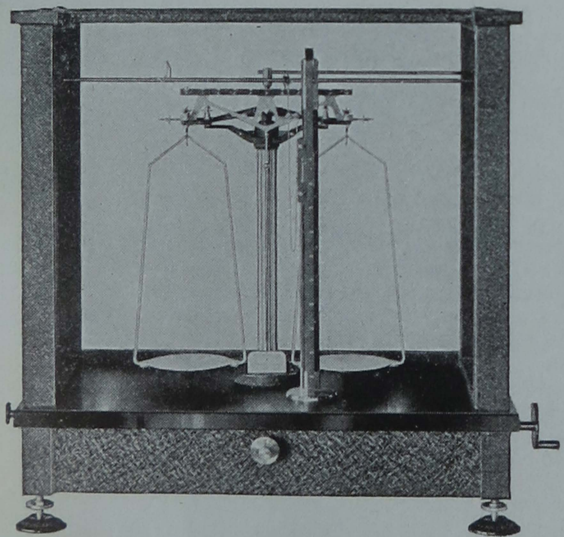
14M4 Balances, Analytical, Ainsworth, Chainweight, Type DLC. Same as 14M3, except without notched beam. **Each**..............**$170.00**

Balances, Analytical, Continued



15M1

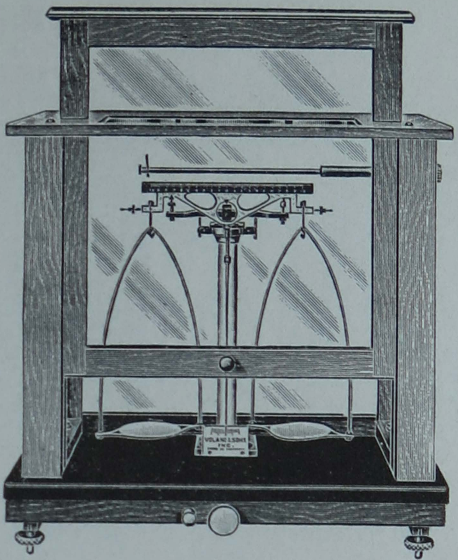
15M1 Balances, Analytical, Students, Ainsworth, Type LC.
Capacity, 200 grams in each pan.
Sensitivity, ⅒th milligram.
Beam, 6 inches long, of hard rolled aluminum alloy. With edges of triangular shaped agate. Graduated with 100 white divisions each side of zero center on black background.
Edges and planes, hard, clear white agate.
Hangers, 4¼ inches wide; 8 inches high; with 3¼ inches diameter aluminum plates
Releasing mechanism of radial drop lever type. Adjustable pan arrests are operated by button in center of beam arrest knob.
Finish of metal work, bright baked-on lacquer, except stirrup support levers and column base which are black enameled.
Case, aluminum, finished in black wrinkled lacquer with counterpoised front door, no drawer, black slate base, and four leveling screws. Width, 18 inches; height, 18 inches; depth, 9 inches.
Weight, shipping, 60 pounds.
Complete with two 10-milligram beam riders. **Each** . . **$75.00**



15M2

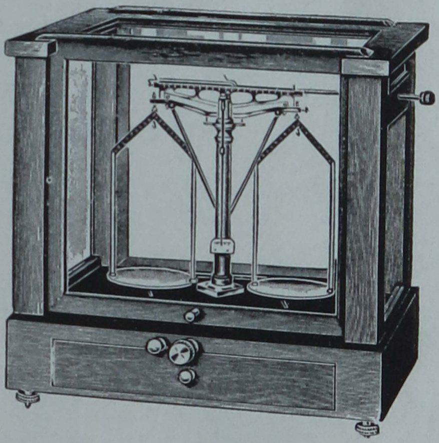
15M2 Balances, Analytical, Students, Chainweight, Notched Beam Ainsworth, Type LCB. Same as 15M1, except equipped with chainweight device and notched beam as described on page 14. **Each** **$135.00**

15M3 Balances, Analytical, Students, Chainweight, Ainsworth, Type LCC. Same as 15M2, except without notched beam. **Each** **$125.00**



15M4

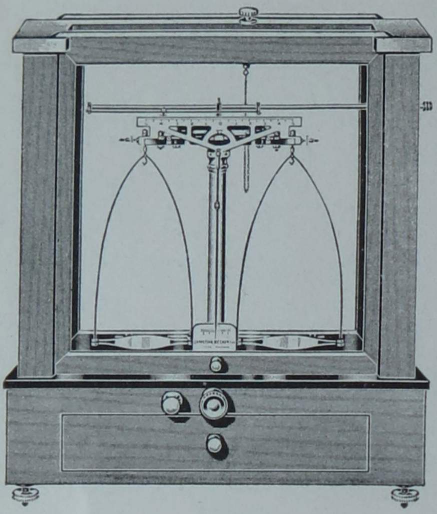
15M4 Balances, Analytical, Students'.
Capacity, 200 grams.
Sensitivity, 0.1 milligram under full load.
Beam, 6 inches long, graduated into 50 divisions on each side of zero point.
Bearings and knives, agate.
Releasing mechanism, straight fall-away type.
Pans, 2.5 inches in diameter; nickel silver, chromium-plated.
Bows, 4 inches wide at pans, 8 inches high; nickel silver, chromium-plated.
Pan arrest, independent for pans with automatic stop.
Case, mahogany, with front counterpoised sliding door. Without drawer. Base, black slate. Dimensions: width, 9 inches; height, 16 inches; length, 17 inches.
Weight, shipping, 45 pounds.
Each **$53.00**



15M5

15M5 Balances, Analytical, Becker, Heavy Capacity. Specially adapted for standardization and calibration purposes.
Capacity, 2000 grams.
Sensitivity, ⅕ milligram.
Beam, 14 inches (35½ cm.) long, bronze. Graduated each side of center to 20 milligrams by ⅕ milligram.
Knife edges, agate.
Bearings, agate planes.
Plates, 8 inches (20 cm.) in diameter. Aluminum.
Bows, 8½ inches (21½ cm.) wide by 16 inches (40½ cm.) high inside.
Pan arrest, independent, with stop.
Case, polished mahogany, glass sides and top; front sliding door, counterpoised; rear door, removable. With level and leveling screws. Width, 30 inches; height, 28¼ inches; depth, 14 inches.
Complete with three 20-milligram riders. **Each** **$335.00**

Balances, Analytical, Becker



16M1

16M1 Balances, Analytical, Becker. Equipped with equilibrium adjuster.
Capacity, 200 grams.
Sensitivity, 1/20 milligram.
Beam, 6 inches (15 cm.) long. Sawed from special aluminum alloy. Graduated each side of center 0 to 5 by 1/10 milligram.
Knife edges, agate.
Bearings, agate planes. All edges entirely freed from bearings when balance is arrested.
Pans, 2⅜ inches (6 cm.) in diameter. Non-corrosive metal.
Bows, 4⅛ inches (10¼ cm.) wide by 8 inches (20 cm.) high. Nickel silver.
Pan arrest, independent, with stop.
Rider carrier, allows rider to be carried in one motion over entire beam in either direction.
Beam arrest arms and beam pivot about a common axis. Supporting points of both arrest arms and of beam move through same arc so that contact between edge and bearings remain the same.
Equilibrium adjuster, thumb screw on top outside of case can be regulated so as to move vernier hook carrying chain either up or down. Adjustment can be made while beam is swinging and case is closed.
Stand, brass, polished and lacquered.
Case, polished mahogany, glass sides and top; front sliding door, counterpoised; rear door, removable. With level and leveling screws. With drawer. Mounted on black plate glass. Width, 16½ inches; height, 18½ inches; depth, 9¼ inches.
Weight, shipping, 64 pounds.

Each **$145.00**

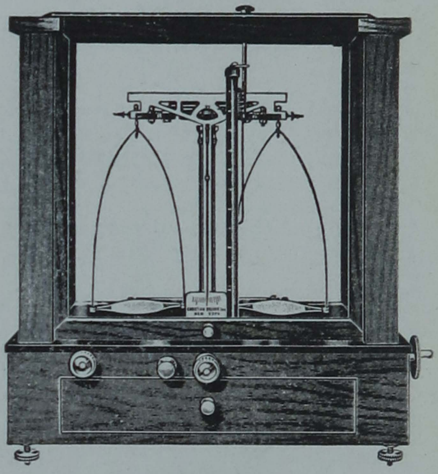
Balances, Analytical, Chainomatic, Becker

16M2 Balances, Analytical, Chainomatic, Becker. Equipped with equilibrium adjuster. Same general specifications as 16M1, except equipped with a movable index (Auto-Dex) where by means of a thumb wheel situated at the left front of the case, the index plate may be moved right or left as required until the pointer is coincident with zero of the index.

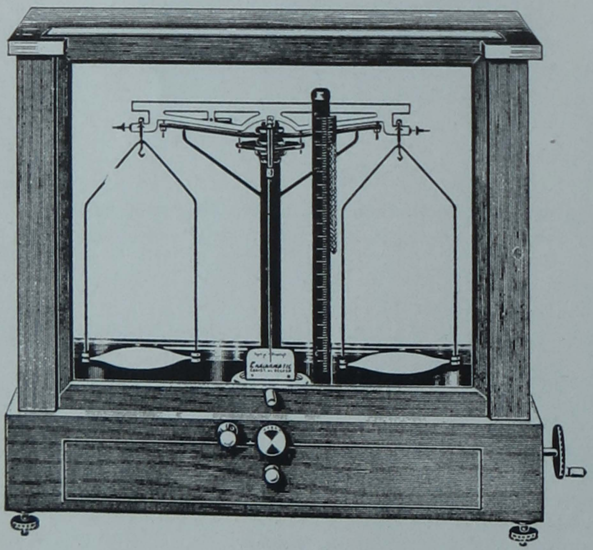
The graduated column and vernier read to 100 milligrams by 1/10 milligram, and no weights smaller than 100 milligrams are required. **Each** **$185.00**

16M3 Balances, Analytical, Chainomatic, Becker, with Graduated Notched Beam. Equipped with equilibrium adjuster. Same as 16M2, except with beam graduated from left to right, 0 to 1 gram by 100-milligram graduations. No weights are required below 1 gram. The beam weight is rapidly and easily moved from one notch to another by means of a perfected carrier operated from outside of the case.

Each **$205.00**



16M2



16M4

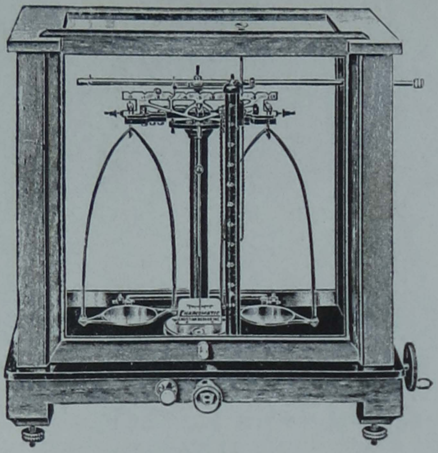
16M4 Balances, Analytical, Chainomatic, Becker. For general laboratory work.
Beam, sawed from special aluminum alloy. Will sustain full load without flexure and maintain adjustment through varying temperature changes.
Knife edges, stellite. Bearings, agate.
Pans and bows, nickel silver.
Pan arrest, independent, with stop.
Releasing mechanism, fall-away type.
Stand, durable black finish.
Case, polished mahogany with glass sides; front sliding door, counterpoised. With level and leveling screws. With drawer. Width, 19½ inches; height, 16½ inches; depth, 9¼ inches.

Capacity, grams	**200**	**350**
Sensitivity, milligrams	1	2
Readings, graduated column and vernier	1 mg. to 1 gm.	.01 to 1 gm.
Beam, length	7½	10
Pans, diameter, inches	2⅜	3
Bows, width, inches	4⅛	4¼
height, inches	8	8¼
Weight, shipping, pounds	60	65
Each	**$105.00**	**125.00**

16M5 Balances, Analytical, Chainomatic, Becker, with Graduated Notched Beam. Otherwise same as 16M4. Beam is graduated from left to right, 0 to 10 grams in 1-gram. Beam weight is rapidly and easily moved from one notch to another by means of a perfected carrier operated from outside of case. No weights from 1 milligram to 11 grams are required.

Capacity, grams	200	350
Each	**$125.00**	**145.00**

Balances, Analytical, Chainomatic, Becker, Continued



17M3

17M1 Balances, Analytical, Chainomatic, Becker. For routine laboratory work. Equipped with equilibrium adjuster, a thumbscrew on the outside of the case which can be regulated so as to move vernier hook carrying chain either up or down. Adjustment can be made while beam is swinging and case is closed.

Capacity, 200 grams.

Sensitivity, 1/20 milligram with 100-gram load (⅒ milligram with full load).

Column, graduated, and vernier reads ⅒ to 100 milligrams. No riders or small weights required.

Beam, 6 inches long (15 cm.), sawed from special aluminum alloy. Will sustain full load without flexure and maintain adjustment through varying temperature changes.

Knife edges, agate.

Bearings, agate planes. All edges entirely free from bearings when the balance is arrested.

Pans, nickel silver, 2⅜ inches (6 cm.) in diameter.

Bows, nickel silver, 4⅛ inches (10¼ cm.) wide by 8 inches (20 cm.) high inside.

Pan arrest, independent, with stop.

Releasing mechanism, fall away type.

Stand, durable black finish, lacquered brass base.

Case, polished mahogany with glass sides and top, front sliding door, counterpoised. Mounted on black glass base. With level and leveling screws. No drawer. Length, 16½ inches; height, 16½ inches; depth, 9¼ inches.

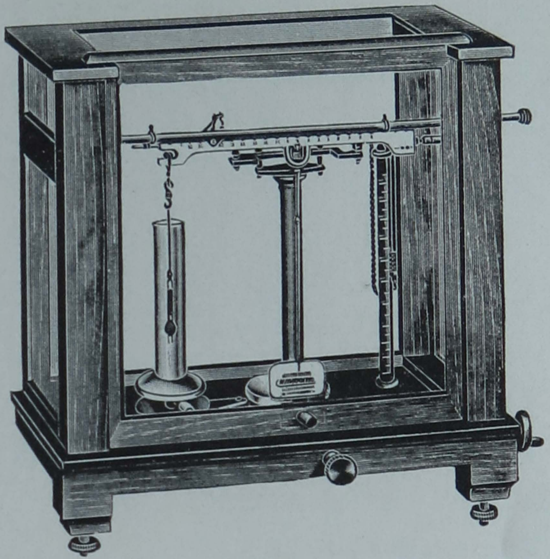
Weight, shipping, 68 pounds.

Each..**$140.00**

17M2 Balances, Analytical, Chainomatic, Becker. Same as 17M1, except with drawer and rear sliding door. Case, 16½ inches wide; 18½ inches high; and 9¼ inches deep. **Each**..**$150.00**

17M3 Balances, Analytical, Chainomatic, with Graduated Notched Beam, Becker. Same as 17M1, except that beam is graduated from left to right 0 to 1 gram in 100-milligram graduations. The beam weight is rapidly and easily moved from one notch to another by means of a perfected carrier operated from outside of case. Chainomatic attachment reads from ⅒ mg. to 100 mg. No weights below 1 gram are required. **Each**..............................**$160.00**

17M4 Balances, Analytical, Chainomatic, with Graduated Notched Beam, Becker. Same as 17M3, except with drawer and rear sliding door. Case, 16½ inches wide; 18½ inches high; 9¼ inches deep. **Each**..............**$170.00**



17M5

17M5 Balances, Specific Gravity, Chainomatic, Becker. For liquids. Direct readings in specific gravity to the fourth decimal place. Accurate and rapid. All determinations are made by placing the beam weight in the proper notch on the beam and obtaining the final reading by adding weight to the beam by means of the chain.

Rotation of the crank at the right hand side raises or lowers the chain, one end of which is hung from the beam; and the other end, from the slide block which is moved up and down a vertical graduated column. This column, provided with vernier, is graduated to give direct readings in specific gravity to the fourth decimal place, reading from 0 to .1 by .0001 specific gravity.

Beam, 9 inches long, sawed from hard rolled aluminum alloy. Will maintain adjustment through varying temperature changes. Graduated from right to left 0 to 2.0 by .1 specific gravity. Beam weight is rapidly and easily moved from one notch to another by means of a rider carrier operated from outside of case.

Knife edges, agate at center, stellite at end.

Bearings, agate.

Plummet, displaces exactly 2 grams of distilled water at 20° C., or if specially ordered, at 15° C. The enclosed thermometer ranges to 30° C.

Case, polished mahogany, with glass sides and top. Front sliding frame is counterpoised. Base is black glass. With level and leveling screws. No drawer. Hole in base is covered by sliding brass support which permits the glass cylinder to be inserted and withdrawn from the case with ease and rapidity.

Weight, shipping, 68 pounds.

For all specific gravities up to 2.0000, to the fourth decimal place. **Each**....................................**$150.00**

17M6 Balances, Specific Gravity, Chainomatic, Becker. Same as 17M5, except with special accessories for determining the specific gravities up to 4.0000 to the fourth decimal place. Accessories consist of stirrup weight, plummet (2 grams displacement) without enclosed thermometer. Plummet specially made for immersion in dense liquids. **Each**.........**$165.00**

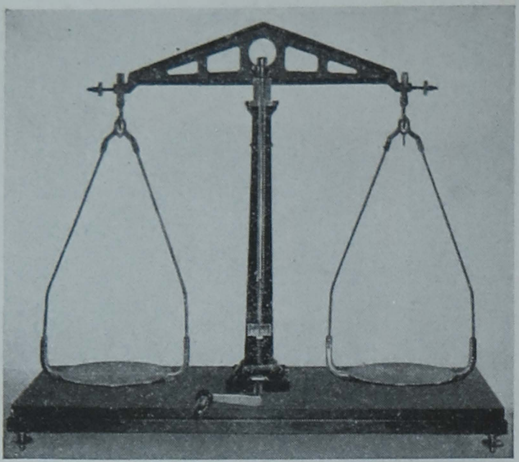
17M7 Balances, Specific Gravity, Chainomatic, Becker. Same as 17M5, except that the beam and column are graduated to give direct readings in specific gravity to the fifth decimal place.

Plummet displaces exactly 5 grams of distilled water at 20° C. or, if specially ordered, at 15° C. The enclosed thermometer ranges to 30° C.

Range, Spec. Gr....	.7 to .9	.78 to 1.0	.9 to 1.1	1.0 to 1.2
Each............	**$165.00**	**165.00**	**165.00**	**165.00**

17M8 Plummets. For any of the above balances. **Each**..**$10.00**

Balances and Accessories



18M1

18M1 Balances, Bullion.

Beam, bronze; great tensile strength and uniform density. Will sustain full load without flexure and will maintain adjustment through varying temperature changes.

Knife edges, hardened steel, accurately ground, gold plated to prevent rusting.

Bearings, agate planes

Beam arrest, holding the beam firmly and relieving the edges from the bearings when the balance is at rest.

Independent arrest, for weight plates, with stop.

Column and base, iron, durable black finish. With level and leveling screws.

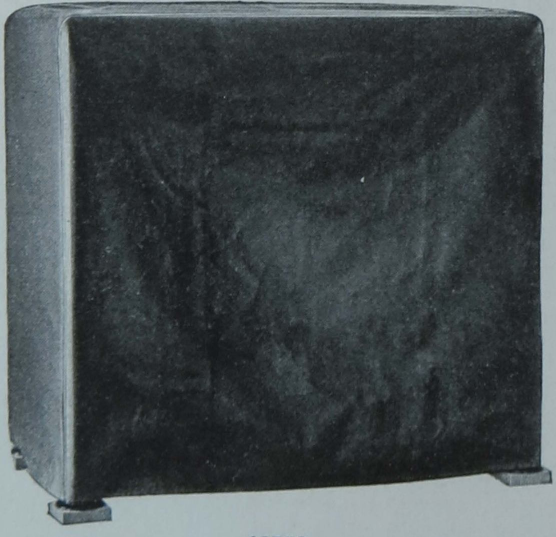
Indicator, oscillates inside column over a horizontal index.

Plates, brass, removable.

Capacity, ounces	**500**	**1000**	**2000**
Sensitivity, grains	½	1	1
milligrams	30	60	60
Beam, length, inches	24	26½	32½
Plates, diameter, inches	9	10	10
Bows, inches	13½x22	15½x25½	16½x27½
Height, overall, inches	36	42	44½
Base, inches	35x11	45x13	45x13
Each, without weights	**$345.00**	**450.00**	**550.00**

18M2 Balances, Bullion. Same as 18M1, except furnished with set of Grade A Troy weights.

Capacity, ounces	500	1000	2000
Each, with weights	**$420.00**	**565.00**	**745.00**

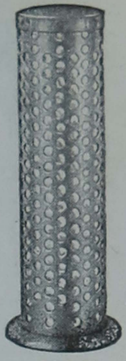


18M3

18M3 Balance Covers. Made of the best rubberized sheeting; dust and moisture proof.

Every balance should be protected by a cover when not in use. When ordering specify the dimensions as follows: width, depth and height of balance. **Each**..........**$2.00**

18M4



18M5

18M4 Balance Magnifiers. For reading the indicator scales of analytical balances. Closer readings of the scale are possible with its use than with the naked eye. The lens is mounted on an adjustable support with felt padded base. Metal parts are nickel-plated. Height overall, 3⅜ inches. **Each**...**$5.00**

18M5 Balance Dessicators, Drierite. A convenient, safe, and efficient drying unit for the analytical balance or other small closed compartments. Made of 22-gauge aluminum perforated with 3/16-inch holes. After repeated regeneration, by heating one hour at 200° C., the unit may be refilled with fresh Drierite. Contents, 150 grams, 4 mesh Drierite. Capacity, about 10 grams of water vapor. Dimensions: 1½x6 inches high; base, 2⅛ inches diameter. **Each**........**$2.00**

Balance Weights

18M7

18M6 Balance Weights, Assay Ton. Lacquered brass. In mahogany box with forceps. An assay ton weight is equivalent to 29.166 grams and contains as many milligrams as there are troy ounces in a ton. If an assay is made of an assay ton sample of ore yielding a button weighing 1 milligram the ore contains one ounce to the ton.

Set contains assay ton weights: 1, ½, ⅕, 1/10, 1/20.

Set..**$6.50**

18M7 Balance Weights, Assay Ton. Same as 18M6, except set contains assay ton weights: 4, 2, 1, ½, ⅕, 1/10, 1/20.

Set..**$8.00**

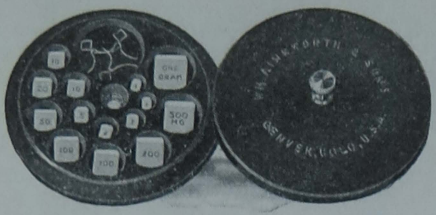
18M8 Balance Weights, Assay Ton, Single.

Wt., A. T.	4	2	1	½	⅓	¼	⅕	1/10	1/20
Each	**$2.20**	**1.80**	**1.60**	**1.40**	**1.40**	**1.40**	**1.20**	**1.00**	**1.00**

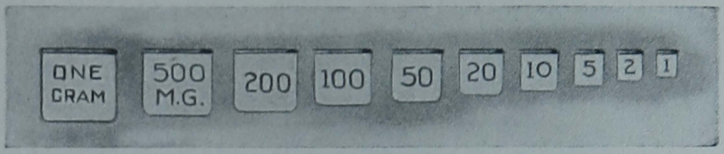
Balance Repairs

Repair of balances handled efficiently and promptly.

Balance Weights and Riders



19M1



19M2

19M1 Balance Weights, Precision, Assay. 1 gram to 1 milligram with two 1-milligram riders. Weights are contained in moulded Bakelite box with velvet lined cover and screw clamp in center. Weights from 1 gram to 50 milligrams, inclusive, either platinum or gold; from 20 milligrams to 1 milligram, of aluminum. Conform to Class M Bureau of Standards specifications.

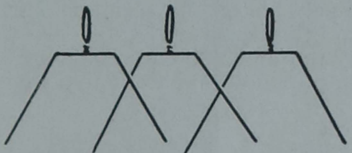
Set number	**100-A**	**100**	**150-A**	**150**	**200-C**	**200**
Tolerance, milligrams	0.005	0.005	0.01	0.01	0.015	0.015
Material	Platinum	Gold	Platinum	Gold	Platinum	Gold
Set	**$28.00**	**25.00**	**18.00**	**15.00**	**15.00**	**12.00**

Tantalum fractions may be substituted for gold fractions in above sets at no additional charge.

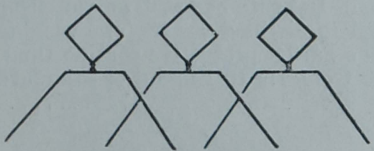
Class M Bureau of Standards Certificate for any of the above sets, $25.00 additional. Sets 100-A and 100 are available with certificate for immediate shipment.

Balance Weights, Milligram. Conform to Bureau of Standards Class M specifications.

Weight	**1000 mg.**	**500 mg.**	**200 mg.**	**100 mg.**	**50 mg.**	**20 mg.**	**10 mg.**	**5 mg.**	**2 mg.**	**1 mg.**
Grade A. Tolerance, .005 mg.										
19M2 Platinum. Each	**$6.00**	**3.50**	**2.70**	**2.10**	**1.45**	....	....	....	....	....
19M3 Gold. Each	**$5.00**	**3.00**	**2.50**	**2.00**	**1.40**	....	....	....	....	....
19M4 Aluminum. Each	**$**....	....	....	....	....	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**
Grade B. Tolerance, 0.01 mg.										
19M5 Platinum. Each	**$5.00**	**2.50**	**1.80**	**1.35**	**.85**	....	....	....	....	....
19M6 Gold. Each	**$4.00**	**2.25**	**1.60**	**1.25**	**.80**	....	....	....	....	....
19M7 Aluminum. Each	**$**....	....	....	....	....	**.50**	**.50**	**.50**	**.50**	**.50**
Grade C. Tolerance, 0.015 mg.										
19M8 Platinum. Each	**$4.50**	**2.30**	**1.45**	**1.10**	**.65**	....	....	....	....	....
19M9 Gold. Each	**$3.00**	**2.00**	**1.25**	**1.00**	**.60**	....	....	....	....	....
19M10 Aluminum. Each	**$**....	....	....	....	....	**.40**	**.40**	**.40**	**.40**	**.40**



19M11 Right Angle Eyes



19M14 Parallel Eyes

Balance Riders, Right Angle Eye. Weight	**.6 mg.**	**1.2 mg.**	**3 mg.**	**6 mg.**	**12 mg.**
19M11 Grade A. Tolerance, .005 mg. **Each** **Box** of 3, **$2.10. Box** of 6, **$3.60. Box** of 12, **$6.00.**	**$ .80**	**.80**	**.80**	**.80**	**.80**
19M12 Grade B. Tolerance, 0.01 mg. **Each** **Box** of 3, **$1.35. Box** of 6, **$2.40. Box** of 12, **$4.20.**	**$ .50**	**.50**	**.50**	**.50**	**.50**
19M13 Grade C. Tolerance, 0.015 mg. **Each** **Box** of 3, **$1.00. Box** of 6, **$1.80. Box** of 12, **$3.20.**	**$ .40**	**.40**	**.40**	**.40**	**.40**

Balance Riders, Parallel Eye. Weight	**.5 mg.**	**1 mg.**	**2 mg.**	**5 mg.**	**10 mg.**
19M14 Grade A. Tolerance, .005 mg. **Each** **Box** of 3, **$2.10. Box** of 6, **$3.60. Box** of 12, **$6.00.**	**$ .80**	**.80**	**.80**	**.80**	**.80**
19M15 Grade B. Tolerance, 0.01 mg. **Each** **Box** of 3, **$1.35. Box** of 6, **$2.40. Box** of 12, **$4.20.**	**$ .50**	**.50**	**.50**	**.50**	**.50**
19M16 Grade C. Tolerance, 0.015 mg. **Each** **Box** of 3, **$1.00. Box** of 6, **$1.80. Box** of 12, **$3.20.**	**$ .40**	**.40**	**.40**	**.40**	**.40**

When ordering riders please specify make of balance and width of beam on which riders are to be used.

Riders with weights less than 12 milligrams, other than those listed above, can be supplied at no extra charge.

Balance Weight Sets, Analytical

WM. AINSWORTH & SONS INC.
DENVER, COLO. U.S.A.

20M1

Balance Weight Sets, Analytical, Class S, Ainsworth, Two-Piece Lacquered. Made of brass, highly polished, special lacquer. Furnished in Bakelite boxes. Guaranteed to pass Bureau of Standards Class S Tolerance Test.

20M1 Balance Weight Sets with Gold Fractions.

Set Number...	**306**	**307**	**308**	**309**
	100 grams to 1 mg., 2 riders	100 grams to 100 mg.	100 grams to 50 mg.	50 grams to 1 mg., 2 riders
Set............	**$23.00**	**21.00**	**22.00**	**21.00**

20M2 Balance Weight Sets with Platinum Fractions.

Set Number....	**301**	**302**	**303**	**304**	**305**
	100 gms. to 1 mg., 2 riders	100 gms. to 1 gm.	100 gms. to 100 mg.	100 gms. to 50 mg.	50 gms. to 1 mg., 2 riders
Set.............	**$25.00**	**18.00**	**22.00**	**23.00**	**23.00**

Set Number 301 immediately available with Bureau of Standards Class S Tolerance Test Certificate. **Set**..**$45.00**

Note: Any of the above sets will be sent to the Bureau of Standards for certification at cost for this certificate. (40c per weight, plus $3.00 fixed charge.) Time required, approximately 60 days.

Balance Weight Sets, Analytical, Class S, Ainsworth, Two-Piece Plated. All weights from 100 grams to 1 gram are made of bronze. Platinum weights are first heavily gold-plated, then platinum plated. The platinum plate affords a harder, more durable wearing surface and insures maintenance of their initial accuracy for a longer period. Furnished in Bakelite boxes.

20M3 Balance Weight Sets, Gold Plated with Gold Fractions.

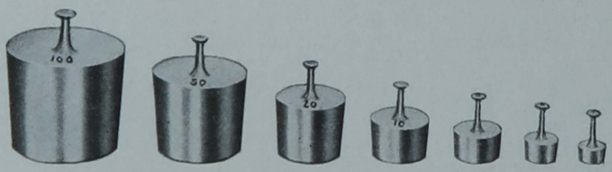
Set Number................................	**262C**	**263C**	**264C**	**265C**	**266C**
	100 grams to 1 mg., 2 riders	100 grams to 1 gram	100 grams to 100 mg.	100 grams to 50 mg.	50 grams to 1 mg., 2 riders
Set..	**$35.00**	**25.00**	**30.00**	**31.50**	**30.00**

20M4 Balance Weight Sets, Platinum Plated with Platinum Fractions.

Set Number................................	**252A**	**253A**	**254A**	**255A**	**256A**
	100 grams to 1 mg., 2 riders	100 grams to 1 gram	100 grams to 100 mg.	100 grams to 50 mg.	50 grams to 1 mg., 2 riders
Set..	**$45.00**	**33.00**	**40.00**	**42.00**	**40.00**

Set Number 252A immediately available with Bureau of Standards Class S Tolerance Test Certificate. **Set**............**$75.00**
Note: Any of the above sets will be sent to the Bureau of Standards for certification at cost of certificate. (75c per weight plus $3.00 fixed charge.) Time required, approximately 60 days.
Note: All fractional weights below 50 milligrams are of aluminum in all sets as listed above.

20M5 Balance Weight Sets, Analytical, Class M, Ainsworth, High Precision. 100 grams to 1 milligram with 2 riders, in velvet-lined, Bakelite boxes. The one-piece bronze weights in these sets are first heavily gold plated and then given a three-hour boiling test in distilled water. The weights passing this test are then platinum plated to bring them up to standard weight and give them a harder protective coating than if gold plated only. They are given a humidity test and a 90-day constancy test before shipment. Conform to Bureau of Standards Class M specifications and tolerances. With platinum and aluminum fractions.
Set..**$135.00**



20M6

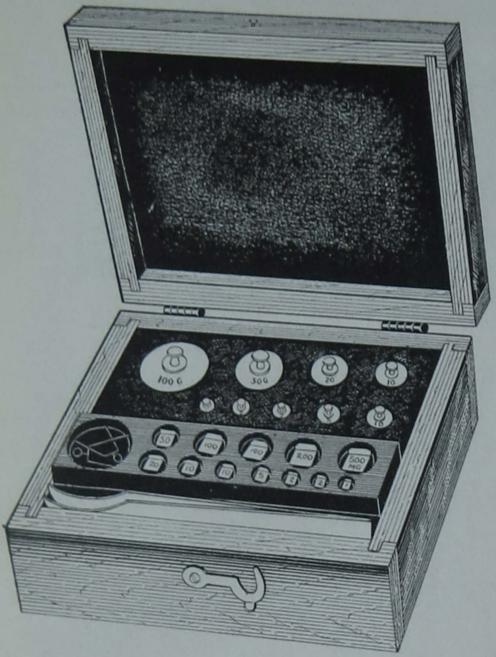
20M6 Balance Weights, Analytical, Class S, Ainsworth. Two-piece lacquered. Conform to Class S, Bureau of Standards specifications and tolerances. Same weights as supplied in sets 20M1 and 20M2.

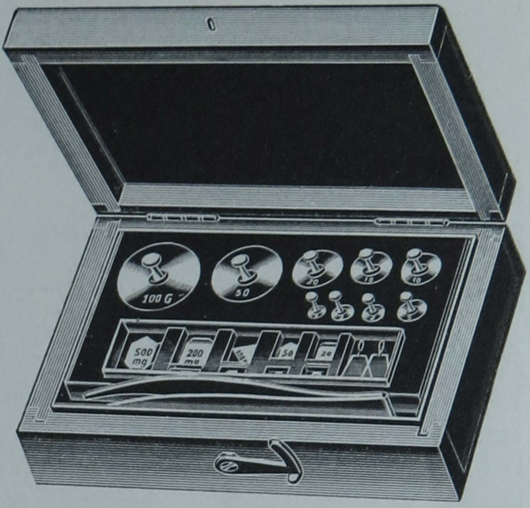
Grams....................................	100	50	20	10	5	2	1
Each....................................	**$3.50**	**2.50**	**2.25**	**2.00**	**1.50**	**1.25**	**1.10**

Balance Weights, Analytical, Class S, Ainsworth. Bronze; with removable handles. Conform to Class S Bureau of Standards specifications and tolerances. Platinum plated weights are first gold plated, then platinum plated. Same weights as supplied in sets 20M3 and 20M4.

Grams....................................	100	50	20	10	5	2	1
20M7 Balance Weights, Platinum Plated. Each .	**$6.00**	**5.00**	**4.00**	**3.00**	**2.50**	**2.25**	**2.00**
20M8 Balance Weights, Gold Plated. Each......	**$5.00**	**4.00**	**3.00**	**2.50**	**2.00**	**2.00**	**1.50**

Balance Weight Sets, Analytical, Continued


21M1


21M2

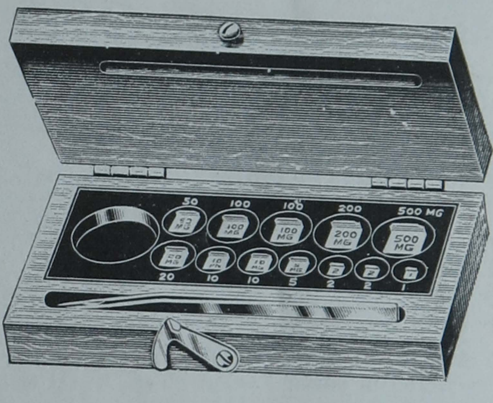
21M1 Balance Weight Sets, Analytical. Gram weights are of brass, gold-plated. Fractional weights from 50 to 500 milligrams, inclusive, are of pure nickel; and from 1 milligram to 20 milligrams of aluminum. In hinged covered weight box with padded lid and velvet-lined holes. With polished brass forceps and two 10-mg. riders.

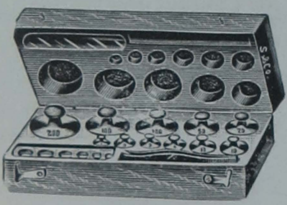
From 1 milligram to grams	50	100
Set	**$13.50**	**14.50**

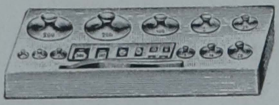
21M2 Balance Weight Sets, Analytical. Gram weights are brass, chromium plated. Fractional weights from 50 to 500 milligrams, inclusive, are of pure nickel silver; and from 1 milligram to 20 milligrams, of aluminum. In hinged, velvet-lined box. With forceps and two 10-milligram riders.

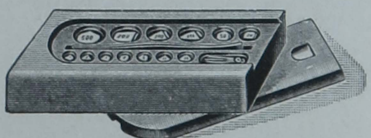
From 1 milligram to grams	50	100
Set	**$11.00**	**13.00**

21M3 Balance Weight Sets, Analytical, Class X. Includes weights from 500 mg. to 1 mg. in mahogany box with cover, removable. Bakelite weight plate and forceps. Without riders. **Set** **$2.50**


21M3


21M4


21M5


21M6

21M4 Balance Weight Sets, Medium Grade. Gram weights are of brass, low form, flat shaped. Fractional weights are of nickel silver. Complete, with forceps, in box with cover having holes for weight knobs.

For 1 mg. to grams	50	100
Set	**$5.00**	**5.50**

21M5 Balance Weight Sets, Medium Grade. Same as 21M4, except contained in a block without cover. Fractions under glass plate, with forceps.

From 1 milligram to grams	20	50	100	200	500	1000
Set	**$2.75**	**3.00**	**4.00**	**6.00**	**8.50**	**13.00**

21M6 Balance Weight Sets, Medium Grade. 1 mg. to 500 mg. Consists of 12 weights: 1 - 1 mg., 2-2 mg., 1-5 mg., 1-10 mg., and 2-20 mg. of aluminum; 1-50 mg., 1-100 mg., 2-200 mg. and 1-500 mg. of nickel silver. In nicely finished wood box with slide cover and forceps. **Set** **$2.00**

21M7 Balance Weight Sets, Medium Grade. 1 mg. to 500 mg. Same as 21M6, except in paste board box without forceps. **Set** . . . . . **$ .50**

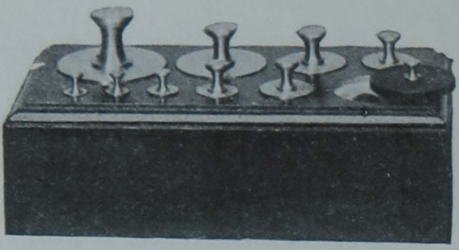
21M8 Milligram Weights, Medium Grade, Single. Same as in sets 21M4 to 21M7, incl.

Milligrams	1	2	5	10	20	50	100	200	500
Each	**$ .06**	**.06**	**.06**	**.06**	**.06**	**.06**	**.06**	**.06**	**.06**

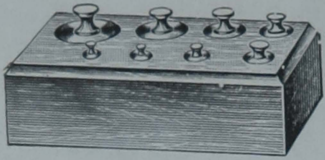
21M9 Gram Weights, Medium Grade, Single. Low Form, flat shaped brass weights as in sets 21M4 to 21M7, inclusive.

Grams	1	2	5	10	20	50	100	200	500	1000
Each	**$ .15**	**.15**	**.20**	**.20**	**.25**	**.40**	**.60**	**1.00**	**2.50**	**3.75**

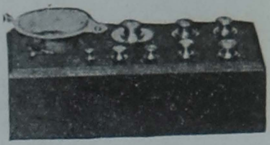
Balance Weights and Pans



22M1



22M6



22M7

22M1 Balance Weight Sets, Brass Metric. For all bulk weighings requiring medium accuracy. Fractional weights are furnished with sets up to and including 100 grams. Furnished in polished wood block.

From 1 gram to grams	20	50	100	200	500	1000	2000
Set	**$1.50**	**2.00**	**2.10**	**3.00**	**3.25**	**7.00**	**16.00**

22M2 Balance Weights, Metric, Single. Tall form brass weights. Same as used in 22M1 balance weight sets.

Grams	1	2	5	10	20	50	100	200	500	1000	2000
Each	**$ .06**	**.06**	**.08**	**.12**	**.15**	**.40**	**.50**	**.80**	**1.95**	**3.00**	**8.00**

22M3 Balance Weights, Factor. Conform with regular Class S weights in form, finish and adjustment. Brass weights are polished and lacquered.

Factor	**Silicon**	**½ Silicon**	**¼ Silicon**	**⅒ Silicon**	**Sulphur**	**½ Sulphur**	**¼ Sulphur**
Material	Brass	Brass	Brass	Aluminum	Brass	Aluminum	Aluminum
Weight, grams	4.702	2.351	1.1755	0.4702	1.3734	0.687	0.3433
Each	**$2.50**	**1.25**	**1.25**	**.50**	**1.25**	**.50**	**.50**

Factor, continued	**Barium Sulphur**	**Coal Sulphur**	**Carbon**	**½ Carbon**	**Ammonia**	**Phosphorous**	**Nitrogen**
Material	Brass	Brass	Brass	Brass	Brass	Brass	Brass
Weight, grams	1.374	1.373	2.7273	1.3636	1.7034	1.63	1.401
Each	**$1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**

22M4 Balance Weights, Sugar, Normal. Single weights made of brass, polished, lacquered and accurately adjusted.

	Half Normal	**Normal**	**Double Normal**
Grams	13	26	52
Each	**$1.50**	**1.75**	**2.50**

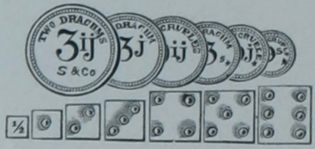
22M5 Balance Weight Sets, Sugar, Normal. Same weights as 22M4, put up in velvet-lined, mahogany box with hinged cover. Set of 3 weights, 13, 26 and 52 grams. **Set** **$7.50**

22M6 Balance Weight Sets, Avoirdupois. Class X, Tolerance, Class C, U. S. Bureau of Standards. Brass weights polished and lacquered in stained wood block. Total weight of set is twice the largest weight.

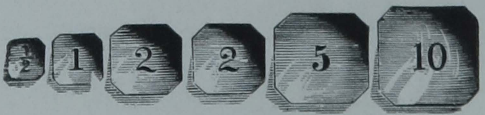
From ⅛ ounce to pounds	½	1	2	4	5
Each	**$4.00**	**5.50**	**7.50**	**10.50**	**16.00**

22M7 Balance Weight Sets, Troy. For bullion weighing. Weights from ¼ ounce up are polished brass, lacquered and accurately adjusted. Contained in a polished wood block with compartment for pennyweight and grain weights.

From ½ grain to ounces, Troy	1	2	5	10
Set	**$2.90**	**4.00**	**5.00**	**7.25**



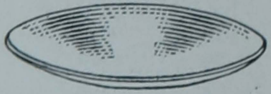
22M8



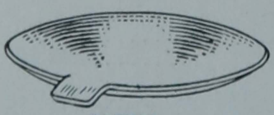
22M9

22M8 Balance Weight Sets, Apothecary. Prescription weights, of brass, coin-shaped, from 2 drams to ½ scruple; of nickel, rectangular-shaped, from 6 grains to ½ grain. **Set** **$1.20**

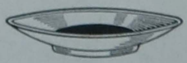
22M9 Balance Weight Sets, Grain. Made of aluminum, cup-shaped. Set includes weights from ½ to 10 grains. **Set** . . **$1.50**



22M10



22M11



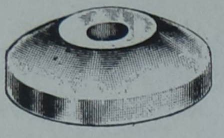
22M14

Balance Pans. Furnished in pairs, accurately adjusted.

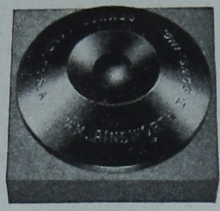
Diameter, inches	2½	2¾	3
22M10 Balance Pans, Glass. Without handles. **Pair**	**$1.50**	**1.50**	**1.50**
22M11 Balance Pans, Glass. With handles. **Pair**	**$1.50**	**1.50**	**1.50**
22M12 Balance Pans, Nickel. With handles. **Pair**	**$1.75**	**1.75**	**1.75**
22M13 Balance Pans, Aluminum. With handles. **Pair**	**$3.00**	**3.00**	**3.00**

22M14 Balance Pans, Assay, Aluminum. ¾-inch in diameter. Black oxidized centers for assay button balances. Without handles. **Pair** **$2.00**

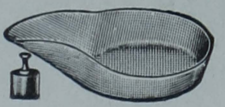
Balances and Accessories



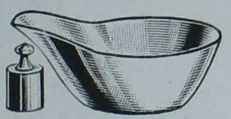
23M1



23M2



23M3



23M5

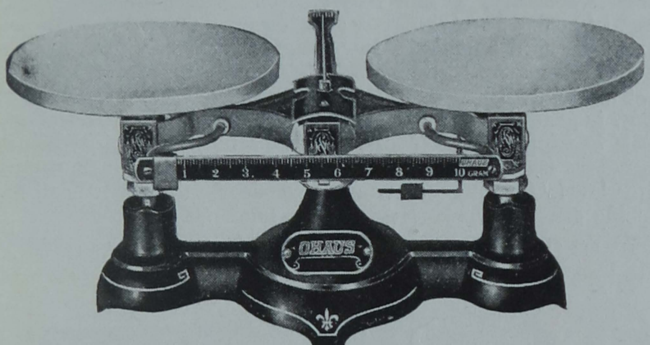
23M1 Balance Rests, Glass. Diameter, 1⅞ inches. **Set** of 4..**$ .80**

23M2 Balance Rests, Bakelite. On sponge rubber pad. **Set** of 4..**$1.00**

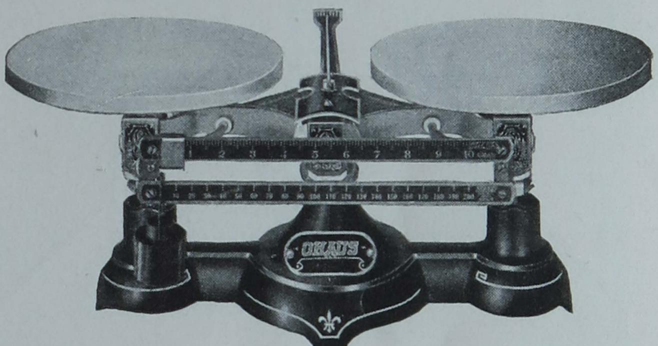
23M3 Balance Scoops, Weighing. Made of sheet aluminum, polished. Large extending spout facilitates pouring of contents. Flat bottom; no handle. Complete with accurate, lacquered brass counterpoise weight, which is numbered to correspond with scoop. Liquid capacity, 10 ml. Depth, ½ inch (13 mm.). Length overall, 2 inches (51 mm.). Diameter at bottom, 1⅜ inches (35 mm.). **Each**..**$1.50**

23M4 Balance Scoops, Weighing. Same as 23M3, except liquid capacity, 60 ml. Depth, ¾ inches (19 mm.). Length overall, 3½ inches (90 mm.). Diameter at bottom, 2⅜ inches (60 mm.). **Each**..**$1.50**

23M5 Balance Scoops, Weighing. For sugar samples. Deep form. Made of nickel silver, polished. Large extending spout simplifies pouring. Complete with accurate lacquered brass counterpoise weight which is numbered to correspond with scoop. Liquid capacity, 120 ml. Depth, 1½ inches (38 mm.). Length overall, 4 inches (102 mm.). Diameter at bottom, 3⅛ inches (80 mm.) **Each**..**$3.50**



23M6

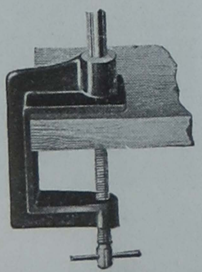


23M7

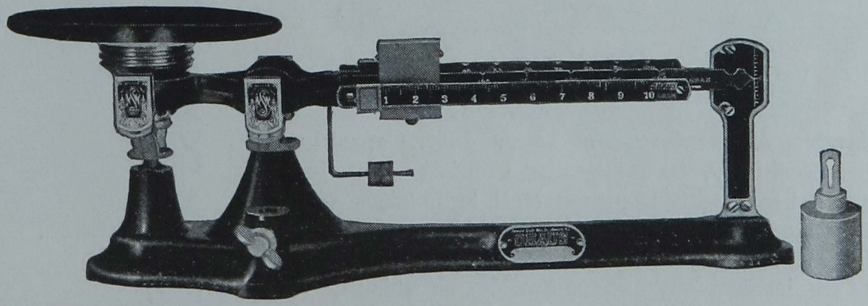
23M6 Balances, Trip Scale, Harvard, Single Beam. For general laboratory work. Capacity, 2 kilos. Sensitivity, ⅒ gram. Side beam is of nickel silver; graduated to 10 grams in ⅒ gram divisions. Graduations and figures are raised; black relief background. Upright indicator is of etched nickel silver. Bearings are agate. Plates are 6 inches in diameter; round; interchangeable; replaceable; made of molded white opal glass. The threaded hub located on dead center of the plate places the weight in exact center of yoke, thus eliminating friction to toggle connections underneath the scale, and making for greater sensitivity. All metal parts are cadmium plated to resist corrosion. Base is finished in black japan. Shipping weight, 10 pounds. **Each**........**$9.50**

23M7 Balances, Trip Scale, Harvard, Double Beam. Otherwise, same as 23M6. Upper beam is graduated to 10 grams in ⅒ gram divisions; lower, 200 grams, in 10 gram divisions. Capacity, 210 grams without extra weights; total capacity, 2 kilos. **Each**..**$12.00**

23M8 Clamp and Rod. For use with 23M6 and 23M7 in specific gravity weighing. Clamp is black japanned; screw, cadmium plated to resist corrosion. (Illustrated below.) **Complete**..**$3.00**



23M8



23M9

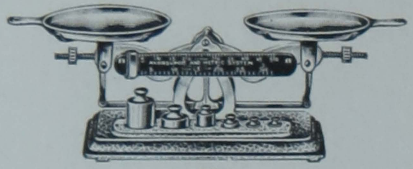
23M9 Balances, Triple Beam. Total capacity, 2610 grams. Sensitivity, ⅒ gram. Beam capacity, 610 grams. Front beam is graduated to 10 grams in ⅒ gram divisions; center, 500 grams in 100-gram divisions; back, 100 grams in 10-gram divisions. Beam is equipped with sliding weights which lock into accurately milled notches at each graduation. Bearings are agate mounted in rust-proof alloy housings. Each bearing is provided with hardened steel friction thrust plate and each is self-aligning, and shielded with close-fitting Ohaus self-locking covers. Scale plate is of Bakelite with threaded hub for changeability; smooth on top to facilitate the removing of materials, powders, etc.; and has no obstructing rim. The base is provided with hole and set screw for mounting on table for specific gravity weighing. **Each,** without weights..**$13.00**

23M10 Balances, Triple Beam. Same as 23M9, except furnished with two 23M12 1000-gram attachment weights. **Each**. **$16.00**

23M11 Attachment Weight, 500-Gram. Each..**$ .80**

23M12 Attachment Weight, 1000-Gram. Each..**$1.50**

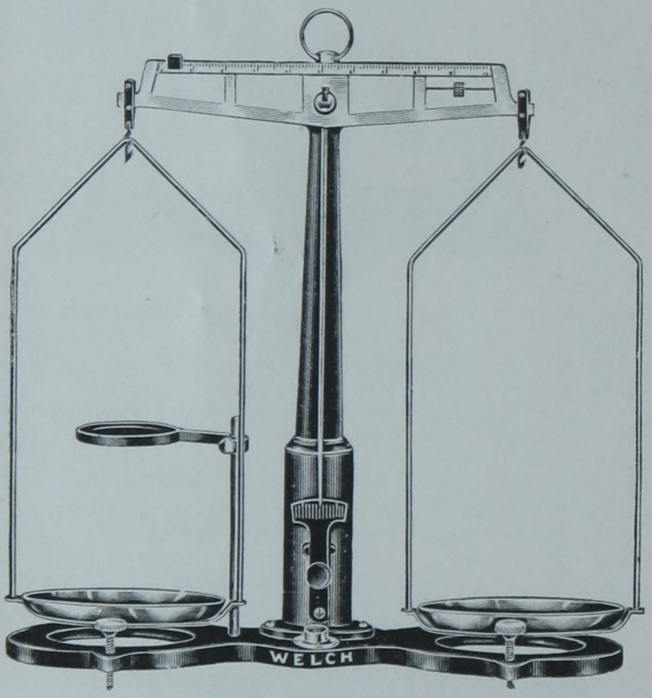
Balances—Scales



24M1

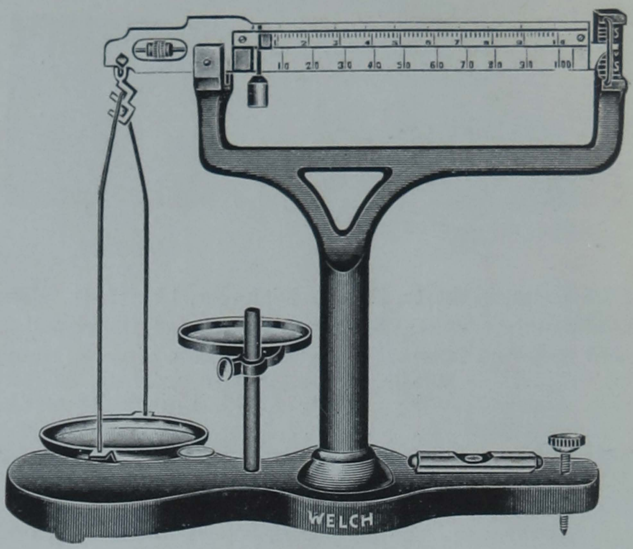
24M1 Balances, Inverted Beam. Sensitive to 1 grain. Made entirely of metal. The beam has a capacity of 50 grains by 1 grain and also 30 decigrams by 1 decigram. Durable; finished in green Duotone with nickel-plated poise, pans and weights. Size, 4x9x4½ inches. Weight, boxed, 1½ pounds. With six avoirdupois weights: two 50-grain and one each ¼, ½, 1 and 2 ounces. **Each**........................... **$4.50**

24M2 Balances, Inverted Beam. Same as 24M1, except with six metric weights: two 10-gram and one each 50, 20, 5 and 2 grams. **Each**........................... **$4.50**



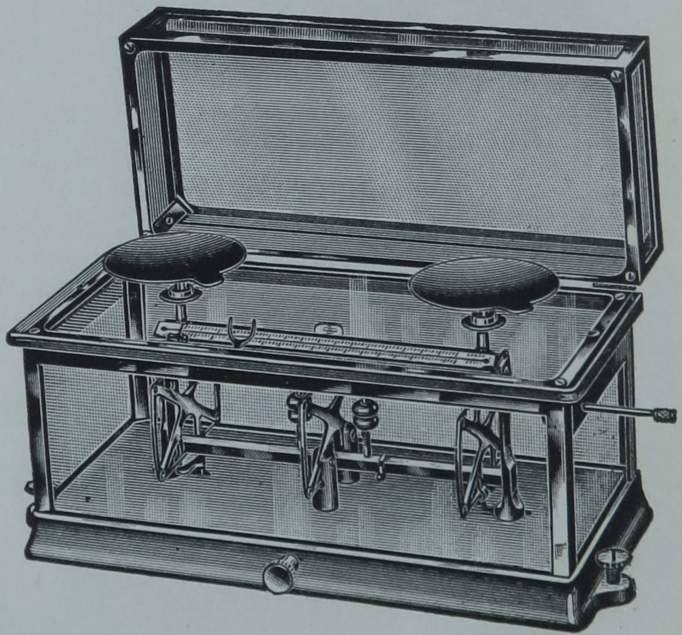
24M3

24M3 Balances, Laboratory. For heavy duty. Capacity, 2000 grams. Sensitivity, 50 milligrams. Consists of a die-cast aluminum beam with hardened steel knife-edges and agate bearings throughout, mounted on a hollow, cast-iron pillar, 42 cm. high, with broad base, leveling screws, and level. Pans are 14 cm. in diameter, and the bearings on which they are hung are locked on the beam. A long pointer, fastened to the lower side of the beam, indicates the deflection of the beam on a flexible scale fastened to the pillar, and by the friction on this scale when the latter is pressed or pulled out, the beam is brought to rest. Beam is graduated in grams and tenths, but the rider can be set to 0.05 gram or less. An adjusting nut on one side of the beam serves to bring it to zero. A rod set into the base on one side carries a platform which can be swung under one of the hooks for specific gravity work. Without weights. **Each**........................... **$20.00**



24M4

24M4 Balances, Triple Beam. Sensitivity, .01 gram. Designed for rapid weighings in specific gravity and other work in physics and chemistry laboratories. Capacity, 111 grams. Etched scales and sliding weights give separate beam capacities of 1, 10 and 100 grams, respectively. The 1-gram beam is graduated to .01 gram. Knife edges are of hardened steel; bearings, agate. Pans, nickel plated, are 3¾ inches in diameter. Base and pillar are crystal finish. Base is equipped with level, leveling screw and an adjustable platform for specific gravity work. Height of balance, 12 inches.
Each... **$20.00**

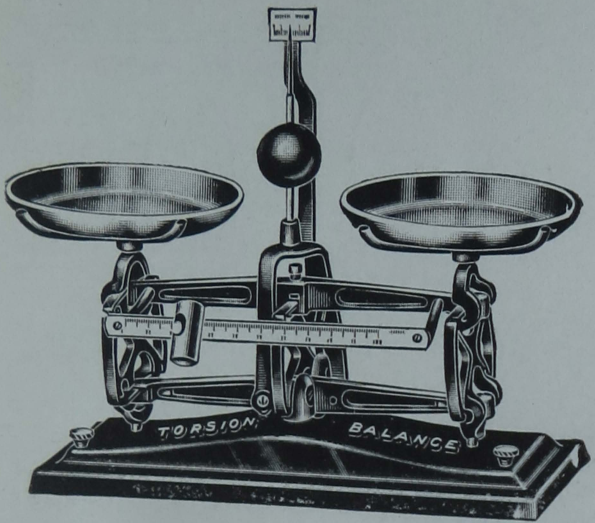


24M5

24M5 Balances, Torsion. Rapid and accurate. Plate glass top overlaps frame; protects working parts. Capacity, 120 grams (4 ounces). Sensitivity, 4 milligrams (1/16 grain). Beam is double graduated, 15 grains by 1/8 grain; 1 gram by 1/100 gram. No small weights required. Pans, nickel silver, are 75 mm. (3 inches) in diameter. Arrest for quick weighing. Case has glass panels, nickel-plated metal frame. Measurements, 13x6⅛x6⅞ inches high. Shipping weight, 23 pounds.
Each... **$80.00**

24M6 Balances, Torsion. Same as 24M5, except without hinged cover. Measurements, 13x6x5½ inches high. Shipping weight, 18 pounds. **Each**..................... **$70.00**

Balances—Scales, Continued



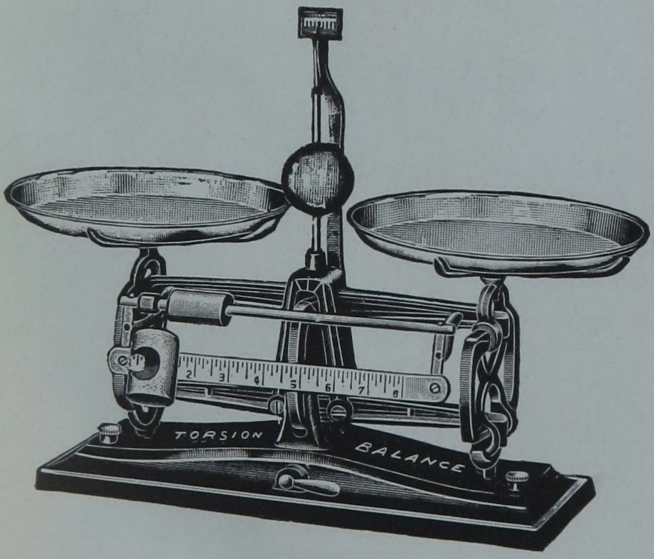
25M1

Balances, Torsion. A laboratory scale of marked convenience and accuracy. Without arrest.
Capacity, 5 pounds (2 kg.)
Sensitivity, ⅒ gram (1½ grain).
Pans, brass, nickel plated, diameter, 6 inches (15 cm.).
Finish, black japan.
Dimensions: 15½x7x12½ inches high.
Weight, shipping, 26 pounds.

25M1 Balances, Torsion. With beam graduated 10 grams by ⅒ grams. **Each**.............................. **$34.00**

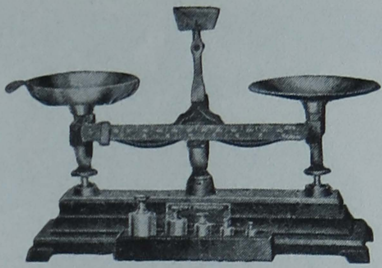
25M2 Balances, Torsion. With beam graduated 100 grams by 1 gram. **Each**.............................. **$34.00**

25M3 Balances, Torsion. Same as 25M1, except with arrest. **Each**.............................. **$38.00**



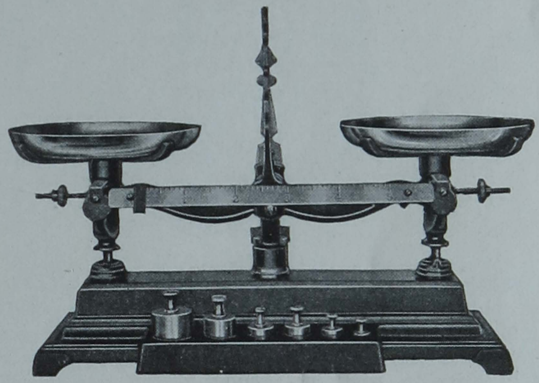
25M4

25M4 Balances, Torsion. Provided with sliding tare weights on upper beam to counterpoise containers, thus facilitating weighings. Suitable for mortar mixes according to A. S. T. M. and Cement Reference Laboratory specifications. With arrest.
Capacity, 5 pounds (2 kg.).
Sensitivity, ⅛ gram (2 grains).
Beam, graduated 100 grams by 1 gram.
Pans, brass, nickel plated. Diameter, 6 inches (15 cm.).
Finish, black japan.
Dimensions: 15½x7x12½ inches high.
Weight, shipping, 26 pounds.
Each.............................. **$40.00**



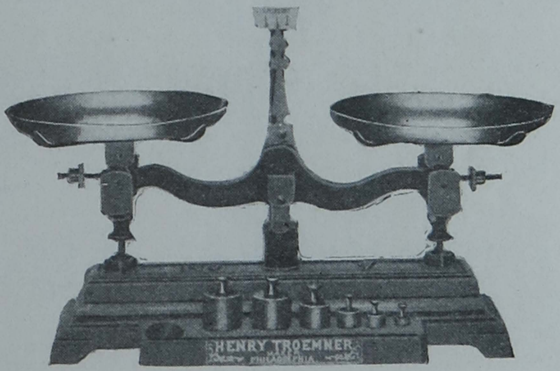
25M5

25M5 Balances, Laboratory Scales, Troemner. Supplied with metric brass weights, 50, 20, 20, 10 and 5 grams, fitted on the base shelf.
Capacity, 110 grams.
Sensitivity, ⅒ gram.
Beam, graduated on upper row up to 120 grains in 1-grain divisions, and on lower row to 8 grams by ⅒ gram divisions.
Pans, nickel plated (one removable, the other, rigid). Diameter, 3¾ inches.
Bearings, Steel. Indicator, upright. Base, iron.
Each.............................. **$15.00**



25M6

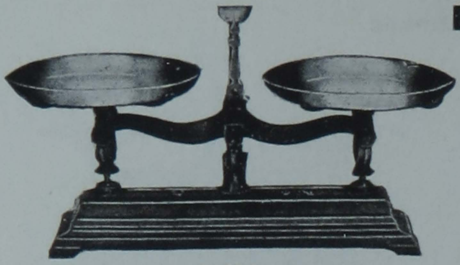
25M6 Balances, Laboratory Scales, Troemner. Supplied with metric brass weights, 100, 50, 20, 20, 10, and 5 grams.
Capacity, 210 grams.
Sensitivity, ⅒ gram.
Side beam, graduated on upper row up to 120 grains by 1-grain divisions, and on lower row to 8 grams by ⅒ gram divisions.
Pans, nickel plated, removable. Diameter, 5 inches.
Bearings, steel.
Indicator, upright.
Each.............................. **$17.75**



25M7

25M7 Balances, Laboratory Scales, Troemner. Supplied with metric brass weights, 100, 100, 50, 20, 20, and 10 grams.
Capacity, 310 grams.
Sensitivity, ⅒ gram.
Side beam, graduated on upper row up to 120 grains by 1-grain divisions; and on lower row to 8 grams by ⅒ gram divisions.
Pans, nickel plated. Diameter, 6 inches.
Bearings, steel. Base, iron.
Indicator, upright. Index, ivory.
Each.............................. **$16.75**

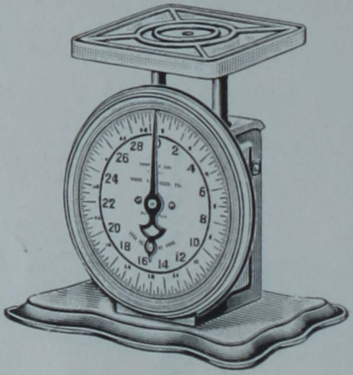
Balances—Scales, Continued



26M1

26M1 Balances, Robervahl, Flux Scales. Finished in dark brown. Furnished with heavy brass pans, upright indicator and graduated ivory index scale.

Capacity, pounds	**1**	**2**	**5**
Sensitivity, grains	10	15	20
Diameter of pans	5½	8	9
Each	**$12.00**	**13.00**	**16.00**



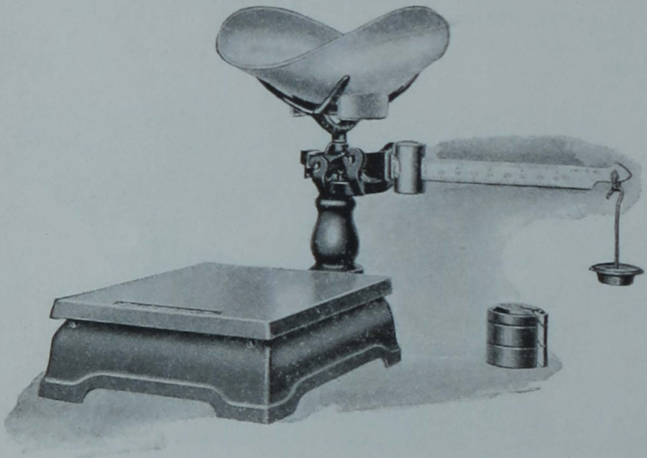
26M2

26M2 Balances, Spring Platform Scale. Finished in ivory. Sturdy construction and broad base assure proper balance. The double upright posts supporting the square steel platform permit the center of weight to be immediately over the spring in keeping with the principles of mechanics. Extra large glass covered slanting dial with distinct figures and graduations. Adjusting screw permits tare to be deducted when scale is used with scoop, plate or basket.

Capacity, 30 pounds by ounces. Dimensions: 6½x8½x9½ inches. Weight, shipping, 4¼ pounds.

Each..**$2.00**

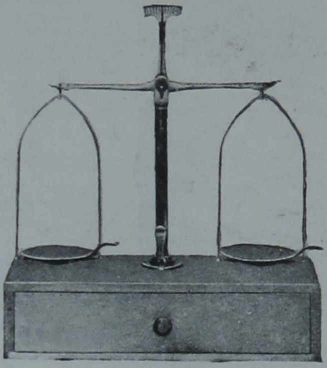
26M3 Balances, Spring Platform Scale. Same as 26M2, except with tin scoop with foot. **Each**..............**$2.50**



26M4

26M4 Balances, Counter Platform Scales, with Single Brass Beam. Allows weighing independently with either scoop or platform. Iron frame; large iron platform; tin scoop supported in broad fork; patented split hoop; nickel-plated counterpoise; loose weights. Finished in gray baked enamel. Capacity, 250 pounds. Beam graduated on upper row, 5 pounds by ½ ounce; on lower row, 50 pounds by ¼ pound. Platform, 10½ by 13½ inches. **Each**..............**$20.00**

26M5 Balances, Counter Platform Scales, with Double Brass Beam. Front bar graduated 5 pounds by ½ ounce; back bar graduated 50 pounds by ¼ pound. **Each**....**$22.00**



26M6

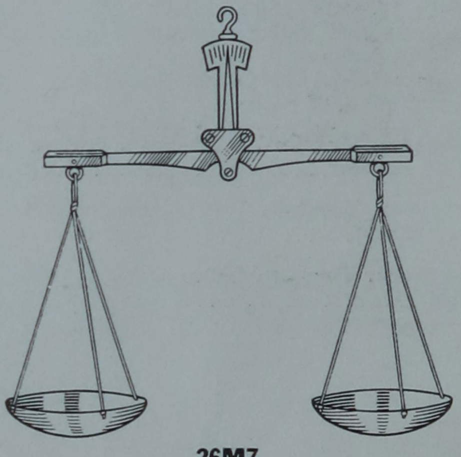
26M6 Balances, Army Prescription. On finished wood box. Scale can be taken apart and packed away in a drawer of box. Furnished with a full set of weights, 2 drachms to ½ grain. Capacity, ½ ounce.

Sensitivity, ¼ grain.

Beam, 5¾ inches long.

Pans, 2 inches in diameter.

Each..**$6.00**

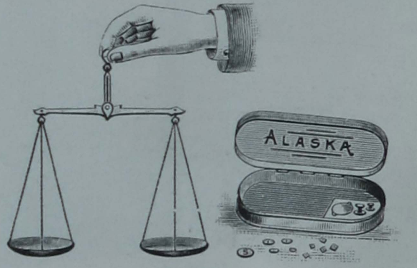


26M7

26M7 Balances, Hand. Without weights.

Beam, 7½ inches long.

Pans, of white composition, 3 inches in diameter. Suspended on cords. **Each**..........................**$2.00**



26M8

26M8 Balances, Troy, Pocket Hand Scales. Especially for prospectors, placer miners, and an accurate balance for field use. Put up in neat tin boxes with oval ends, and enameled green with bronze stripes.

Entire scale is of brass, including deep brass pans, hung with brass chains.

Furnished with full set of accurate Troy weights, including pennyweight and grain weights.

Capacity, 2 ounces Troy.

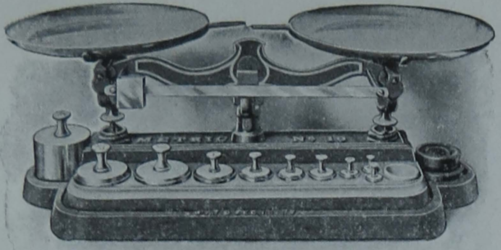
Sensitivity, ½ grain.

Pans, 3 inches in diameter.

Each..**$6.00**

26M9 Balance Weight Sets, Troy. For 26M8. 2 ounces to ½ grain. **Set**..................................**$2.50**

Balances—Scales, Continued

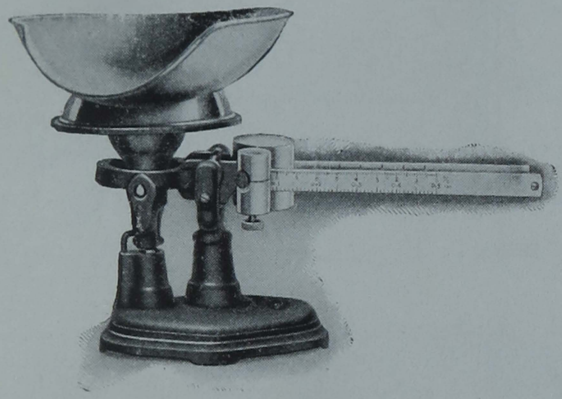


27M1

27M1 Balances, Metric Solution Scales. An even balance scale for making rapidly reagent or any other kind of composite solutions.

Made with two movable brass pans. The weight rack is attached to the base of the scale, and in it are fitted the weights which are made of solid brass. The scale is provided with a beam in front, undivided, and is used for balancing the bottles or containers.

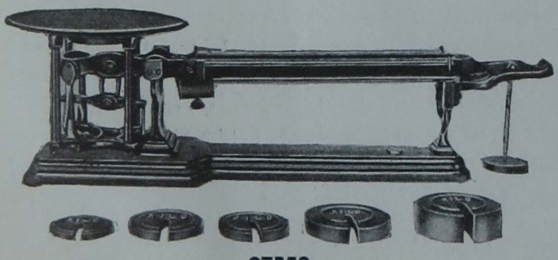
Capacity, kilos	**1**	**5**
Sensitivity, mg.	500	500
Diameter, pans, inches	5½	9
Each	**$27.00**	**36.00**



27M2

27M2 Balances, Moisture Percentage Scales. Used to quickly ascertain the amount of moisture in ores. A sample is weighed out to the full capacity of the scale. The ore is then dried or roasted in an oven and re-weighed, and the correct percentage of moisture is given directly by the percent graduations at the bottom of the beam. No calculations are necessary.

Capacity, 5 pounds. Beam—front bar: upper row, 10x0.1 per cent; lower row, 0.5x0.01 pound. Back bar: upper row, 4.5x0.5 pounds; lower row, 90x10 per cent. **Each** **$30.00**



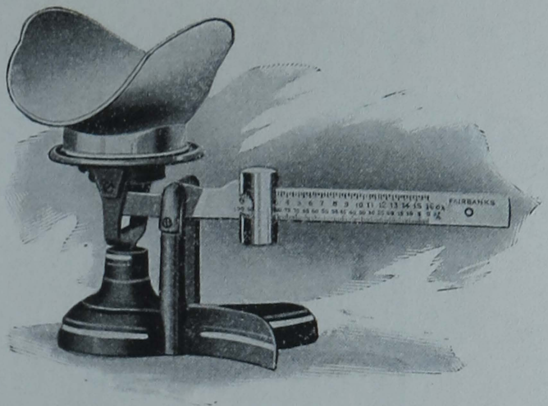
27M3

27M3 Balances, Solution Scales, Percentage. Will weigh liquids with accuracy. Scale is provided with two weighing beams and sliding poises.

One of these is divided into 100 parts, each part representing one gram. The other beam is divided into 10 parts, each part representing 100 grams.

A bar with a sliding poise is placed under the weighing beam, for the purpose of balancing the empty bottle or container, which is quickly done by sliding the poise along the bar until a correct balance is secured.

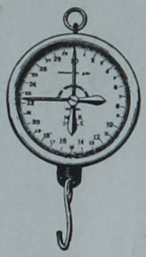
Capacity, 20 kilos. Sensitivity, 1 gram. **Each** **$58.50**



27M4

27M4 Balances, Percentage Scales. For sand and pulp. With scoop. Used in determining the quantity of the various sizes of sand. The beam is graduated to 50 grams in ½-gram divisions, and into 100 parts representing percentage when 50-gram sample is used. **Each** **$15.00**

27M5 Balances, Percentage, Scales. Same as 27M4, except with upper portion of beam graduated to one pound in ¼-ounce divisions. The lower portion of the beam reads percentage when a one-pound sample is used. **Each** **$12.00**

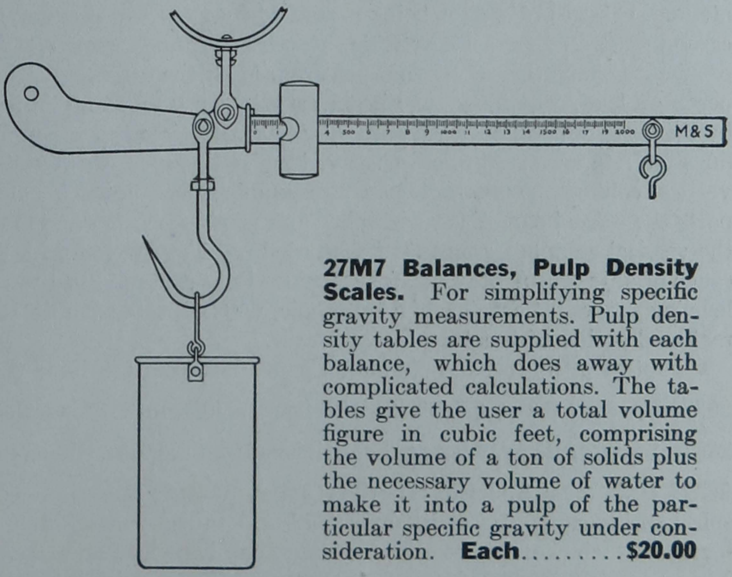


27M6

27M6 Balances, Pulp Density Scales. With one fixed and one adjustable pointer which can be reset to zero to eliminate calculating tare weight of container.

Has 7-inch lacquered brass dial. The black case measures 8¼ inches outside.

Capacity, 40 pounds by ⅒ of a pound. The dial reads 30 pounds, and the indicator makes 1½ revolutions for the full capacity. **Each** **$4.25**

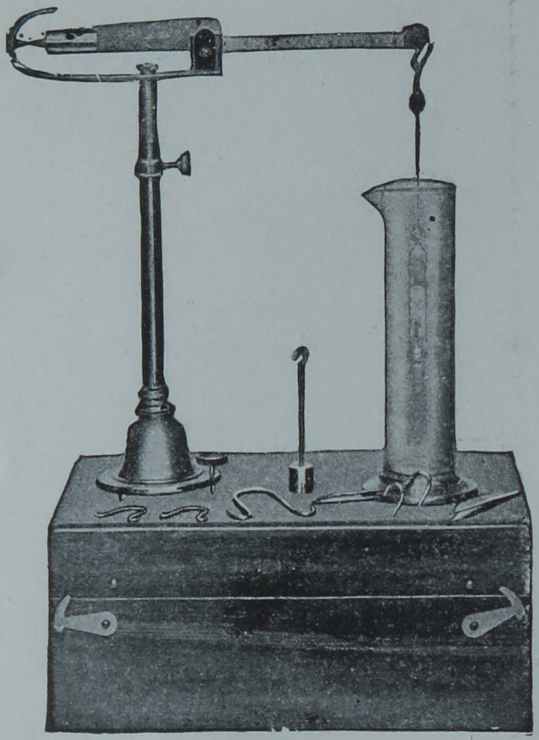


27M7 Balances, Pulp Density Scales. For simplifying specific gravity measurements. Pulp density tables are supplied with each balance, which does away with complicated calculations. The tables give the user a total volume figure in cubic feet, comprising the volume of a ton of solids plus the necessary volume of water to make it into a pulp of the particular specific gravity under consideration. **Each** **$20.00**

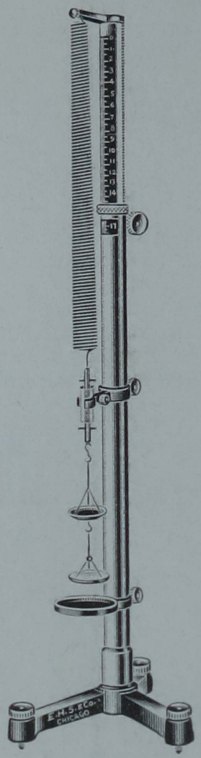
27M7

Note: Pulp density tables are in the Useful Information section in the rear of this catalog.

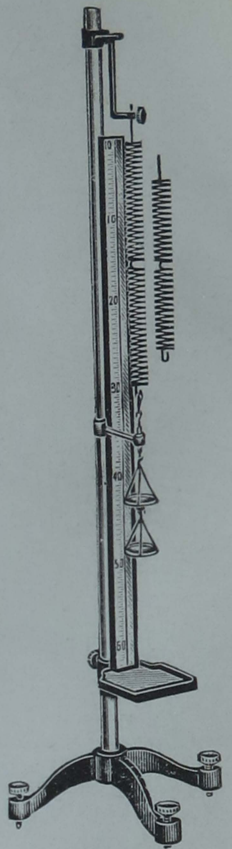
Balances, Specific Gravity



28M1



28M5



28M8

28M1 Balances, Specific Gravity, Westphal. For determining density of liquids. Readings to fourth decimal are obtained with high accuracy. Balance is mounted on polished hardwood case. All parts are heavily lacquered. Complete with plummet, jar, set of riders, forceps and polished case. **Each**........ **$30.00**

28M2 Plummet, Only. Each........ **$3.75**

28M3 Jar, Only. Each........ **$ .18**

28M4 Set of Riders. Contains two each of 5, .5, and .005-gram. **Set**........ **$2.50**

28M5 Balances, Specific Gravity, Jolly. Especially suitable for specific gravity determinations of solids by the displacement method, changes of weight being measured by the corresponding linear elongation of the spring. Two springs are supplied, each carefully selected for a linear ratio, heat treated, and permanent in characteristics. One is sensitive to 2 milligrams with an approximate elongation of 50 mm. per gram load; the other, sensitive to 10 milligrams with an approximate elongation of 12 mm. per gram load. The inner tube is graduated from 0 to 50 cm. in intervals of 1 mm. and travels along a vernier on the outer tube by means of which linear readings may be made directly to .1 mm. The indicator is a metal rod with stops, engraved with three lines for reference against an engraved white line on a surrounding glass tube, the latter being held in a clamp attached to the vertical column. Two sample pans are supplied. The upper is aluminum with suspension wire and loop. A hook underneath supports the second pan, glass, with platinum wire suspension and loop. A platform for a containing vessel is adjustably attached to the vertical column by means of a knurled head screw clamp. A wide range of application is allowed by the corresponding wide range of adjustment provided for reference indicator tube and vessel platform. The support is built on a heavy tripod base with leveling screws. It consists of a telescopic, vertical, tubular unit, the inner tube of which is controlled for elevation by an internal rack and pinion with external milled head.

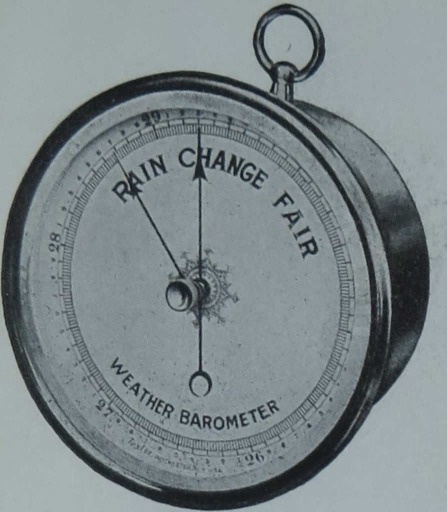
Complete with glass and aluminum pans, vessel platform and two springs. **Each**........ **$50.00**

28M6 Spring, Only, Light. Sensitivity, 2 milligrams. Elongation per gram load, approximately 50 mm. **Each**........ **$ .85**

28M7 Spring, Only, Heavy. Sensitivity, 10 milligrams. Elongation per gram load, approximately 12 mm. **Each**........ **$ .85**

28M8 Balances, Specific Gravity, Jolly, Simple Form. Recommended for high school work. Consists of a sensitive steel spiral spring supported at its upper end in front of a meter stick mounted on the vertical 13 mm. rod which forms the support for the attachments. Two spiral springs, one light and one heavy, wound so as to prevent twisting, are furnished. The larger has a capacity of approximately 100 grams, with a sensitivity of 10 milligrams; the smaller, a capacity of approximately 7 grams, and a sensitivity of 2 milligrams. All supports are adjustable. Furnished with two aluminum pans suspended by copper wires. A platform is mounted on the support rod, and the entire apparatus is supported on a heavy enameled tripod with leveling screws. Complete without weights. **Each**........ **$10.00**

Barometers



29M1

WEATHER BAROMETER
SHORT & MASON
LONDON

29M2

RAIN CHANGE FAIR
COMPENSATED

29M4

29M1 Barometers,* Aneroid. In lacquered brass 5-inch case. **Scale 26 to 31 inches.** White enameled dial; good grade movement. **Each** **$12.00**

*Available at no extra cost on special order, for medical and scientific use, with dials engraved to give metric measurements in addition to the ordinary inch scale, but without weather words.

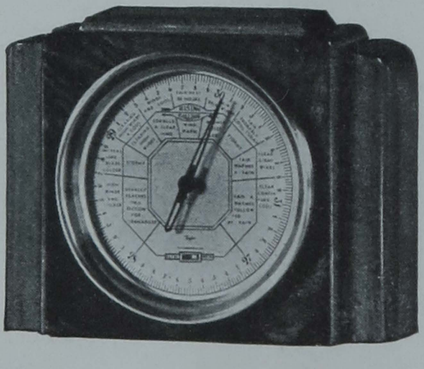
29M2 Barometers, Aneroid, Taylor. Lacquered brass case 5 inches in diameter. **Scale 23 to 29 inches.** Open-center enameled-metal dial, good grade movement. **For use between 2900 and 7100 feet. Each** **$18.00**

29M3 Barometers, Aneroid, Taylor, for High Altitude. Same as 29M2, except **scale 21 to 27 inches for use between 4900 and 9500 feet. Each** **$18.00**

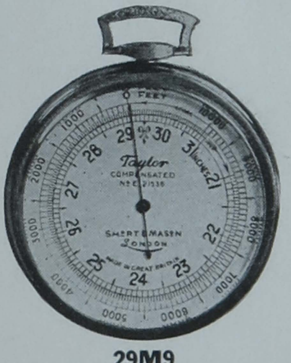
29M4 Barometers, Aneroid, Taylor. Lacquered brass case 5 inches diameter. **Scale 25 to 31 inches.** Open-center silvered-metal dial; special best grade compensated movement. **For use between sea level and 2900 feet. Each** **$20.00**

29M5 Barometers, Aneroid, Taylor. Same as 29M4, except with **scale 23 to 29 inches for use between 2900 and 7100 feet. Each** **$25.00**

29M6 Barometers, Aneroid, Taylor, for High Altitudes. Same as 29M4, except with **scale 20 to 26 inches for use between 5950 and 11,800 feet. Each** **$25.00**



29M7



29M9

29M11

29M7 Barometers, Taylor Stormoguide. Two toned walnut case, 6¼x4½ inches. Brass bezel and silver dial with black weather directions. Good grade movement with automatic signal device which tells when the pressure is rising and when it is falling, and replaces all need for the old style hand-set pointer. **Scale 26 to 31 inches for use between sea level and 2900 feet. Each** **$12.50**

29M8 Barometers, Taylor Stormoguide. Same as 29M7, except **for altitudes 3500 to 7000 feet. Each** ... **$14.00**

29M9 Barometers, Aneroid. Gilt case with 1¾ inch silvered-metal dial. **Scale 21 to 31 inches. Range to 8000 feet** in 100-foot divisions. In soft leather case. **Each** **$27.50**

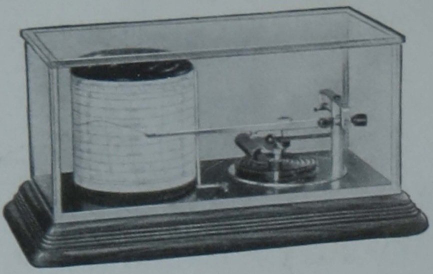
29M10 Barometers, Aneroid. Same as 29M9, except **reading to 12,000 feet** in 100-foot divisions. **Each** ... **$30.00**

29M11 Barometers, Mercurial, Observatory Pattern. Identical in pattern to those supplied to the U. S. Weather Bureau. Metal parts are solid bronze, gun metal finish. Panel is mahogany. Reflectors are opal glass. Bore of the tube 0.25 inch; scale divisions in 1/10ths; vernier reading to 1/100ths. **With scale 26 to 31 inches, for altitudes up to 3,000 feet. Each** **$82.00**

29M12 Barometers, Mercurial. Same as 29M11, except with **scale 24 to 31 inches, for altitudes up to 5000 feet. Each** **$85.34**

29M13 Barometers, Mercurial. Same as 29M11, except with **scale 21 to 31 inches, for altitudes up to 8000 feet. Each** **$87.00**

29M14 Barometers, Mercurial. Same as 29M11, except with **scale 18 to 31 inches, for altitudes up to 12,000 feet. Each** **$88.67**

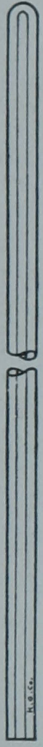


30M1

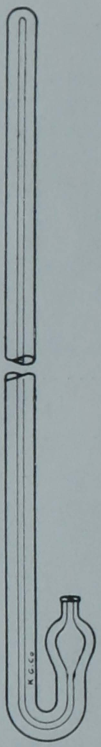
30M1 Barometers, Recording, Taylor. With glass covered case and seven-day clock for turning the chart cylinder. Unit diaphragm movement compensated for temperature. Forecast cards, a year's supply of No. 30M3 7-day charts, and bottle of ink.
For **altitudes 0 to 3500 feet. Each**...............$60.00

30M2 Barometers, Recording. Same as 30M1, except for **altitudes 3500 to 7000 feet. Each**................**$70.00**

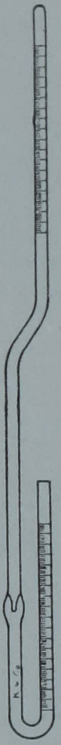
30M3 Charts. Year's supply. Specify range desired.
Price...**$3.00**



30M4



30M5

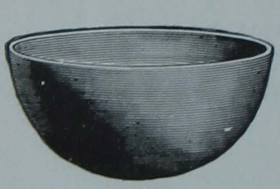


30M6

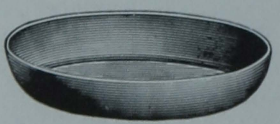
30M4 Barometer Tubes. Ungraduated, straight, with bore approximately 3½—4 mm. Sealed at one end, thick wall. Length, 85 cm. **Each**...........................**$ .50**

30M5 Barometer Tubes. Ungraduated, siphon type, unfilled, with bulb on short arm. Height, 80 cm. **Each**...**$1.25**

30M6 Barometer Tubes, Exax Blue Line, Bunsen. Graduated at top of each arm in millimeter divisions. **Each**..**$4.00**
Case of 12...................................**$38.40**



30M7



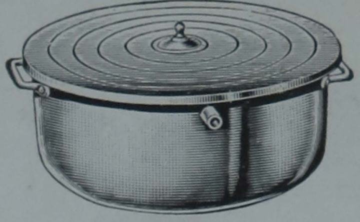
30M8

30M7 Baths, Sand, Deep Form. Of sheet iron.

Diameter, inches	4	6	8	10
Each	**$ .15**	**.25**	**.45**	**.90**

30M8 Baths, Sand, Shallow Form. Of sheet iron.

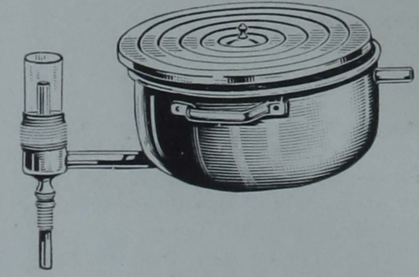
Diameter, inches	4	6	8	10
Each	**$ .10**	**.16**	**.35**	**.70**



30M9

30M9 Baths, Water. Heavy polished copper tin-lined, with concentric rings, cover, and steam escape.

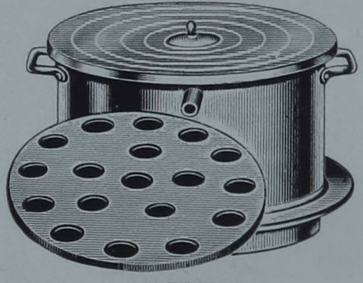
Diameter, Inches	**5**	**6**	**8**	**10**	**12**
Depth, inches	2⅝	2¾	2¾	3¾	4
No. of rings	3	5	7	8	9
Each	**$1.50**	**2.00**	**2.60**	**5.50**	**10.00**



30M10

30M10 Baths, Water. Heavy polished copper tin-lined, with concentric rings, cover, steam escape and Kekule's constant water level regulator.

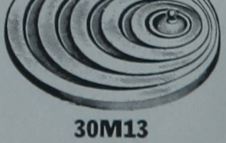
Diameter, Inches	**6**	**8**	**10**	**12**
Depth, inches	2¾	2¾	3¾	4
No. of rings	5	7	8	9
Each	**$3.25**	**3.50**	**6.00**	**10.00**



30M12

30M11 Baths, Water. Heavy polished copper tin-lined. Diameter, 6 inches; depth, 4 inches; with set of 5 concentric rings and a cover. Perforated plate for use with test tubes has 12 holes, each 13/16 inches diameter. **Each**.........**$3.15**

30M12 Baths, Water. Same as 30M11, except diameter, 8 inches; depth, 4 inches. Perforated plate has 19 holes, each ⅞ inch diameter. **Each**..........................**$5.00**

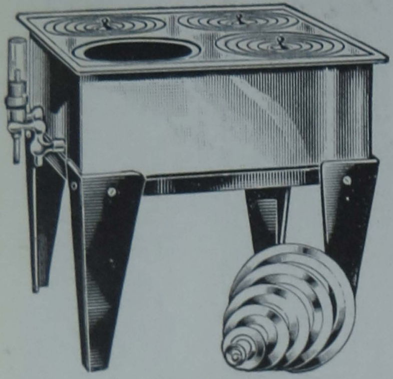


30M13

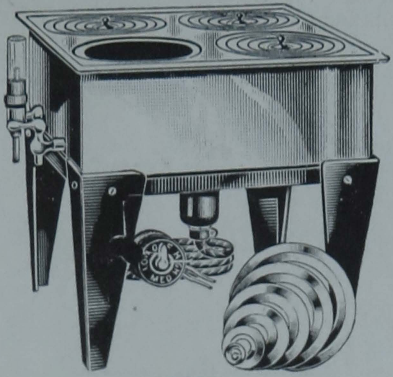
30M13 Bath Cover Concentric Rings. Made of copper, tinned inside with outer ring flanged to fit over rim of bath.

Outside Diameter outer ring, inches	**5**	**6**	**8**	**10**	**12**
No. of rings, not including cover	4	5	7	8	9
Set	**$ .70**	**.90**	**1.50**	**2.15**	**4.00**

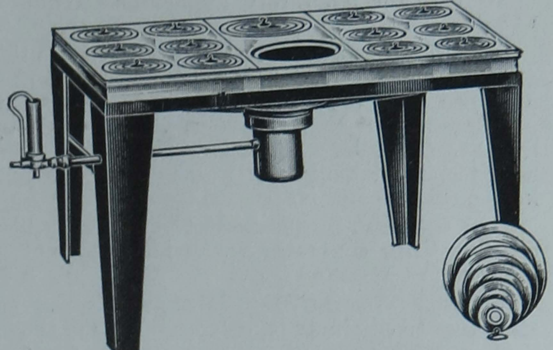
Baths, Water



31M1



31M3



31M4

Baths, Water, Rectangular. Made of copper tinned on the inside and sprayed on outside with metallic copper. Depth of baths 5 inches. Each bath is fitted with a constant water-level cup with gauge glass and rubber connections; brass drain cock; a full set of tinned copper concentric rings, plus a cover, for each bath opening; and a removable japanned iron rectangular support 9 inches high.

Gas Heated. Convenient because of being portable; furnished with sheet iron plate to prevent the flame from coming into contact with the bottom of the bath. Furnished without burner.

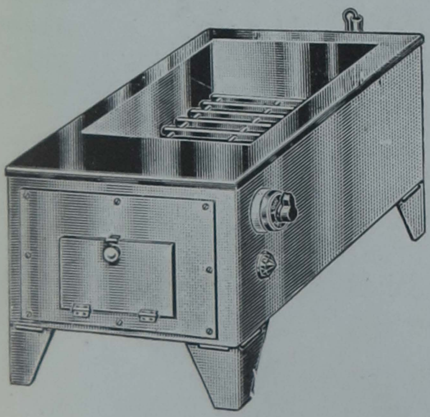
Steam Heated. Where steam under pressure is available, steam heated baths can be operated at very low cost. Steam coils are of seamless tinned copper tubing guaranteed to carry pressures up to 250 pounds, and are equipped with ¼ inch ground joint leak-proof brass unions for ready connection to steam supply and return.

Electrically Heated. Fitted with an electric immersion coil and three-heat switch and 6-foot leads; can not be used on an ordinary lamp socket because of the wattage, but must be connected to power circuit of proper capacity. For 110 or 220 volts.

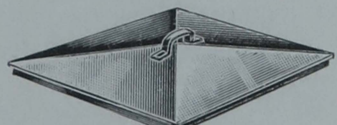
When ordering, always state current characteristics.

Size number	**1**	**2**	**3**
Dimensions, inches	13½x13½	23x13½	28x13½
Number of openings	4	3 and 4	8
Diameter of openings, inches	5⅛	6⅛ and 4⅛	5⅛
Watt consumption electrically heated baths	1100	1650	1650
31M1 Gas Heated. Each	**$18.25**	**$29.00**	**35.00**
31M2 Steam Heated. Each	**27.00**	**38.00**	**45.00**
31M3 Electrically Heated. Each	**60.00**	**70.00**	**80.00**

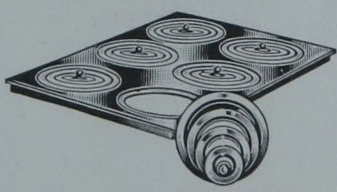
31M4 Baths, Water, Rectangular, Gas Heated. Constructed of heavy copper tinned inside, with replaceable copper heating cup and adjustable gooseneck for maintaining constant water level. Size, 24½x14⅛ inches with 12 openings 3⅛ inches and two openings 5⅛ inches in diameter, covered by concentric rings. Differs from other baths by having a conical bottom with a copper cup to which the flame of the gas burner is applied, thus economizing on both gas and water. Support of heavy sheet iron 14⅜ inches high. Complete, less burner. **Each** **$51.00**



31M5



Gable Type Cover



Concentric Ring Cover

Baths, Water, Rectangular, Constant Temperature. Equipped with two heaters of different capacities, connected to a three-heat switch. Heating elements are of the low gradient immersion type. Both heaters bring up the temperatures quickly from a cold start; one of the heaters then operates intermittently, controlled by a Freas differential linear expansion thermo-regulator, for maintaining a constant temperature at any point between room temperature and 100° C. Each bath is equipped with a removable brass bar-grating shelf; automatic constant level device; drain-cock with hose connection; and pilot light to indicate make and break of the heater circuit.

By using various types of covers, racks, or other accessories, these baths are suitable for the Wasserman, Kolmer, and Kahn tests—inactivations, inspissations, paraffin embedding and many other applications in the biological, physical, medical and chemical laboratory. A typical use is that in connection with a penetrometer for testing asphalt penetration according to **A. S. T. M. Designation D-5.** Inner working chamber is constructed of heavy copper.

31M5 and 31M6 include asbestos-covered heating cord with plug for connection to ordinary lighting circuit, but 31M7 must be connected directly to power line. Prices apply to 110 or 220 volts A. C. single phase 25, 40, 50 or 60 cycle; also to 110 or 220 volts D. C. **When ordering specify current characteristics.**

	Inside dimensions inches	Outside dimensions inches	Watts	**Each**	Gable type cover of copper **Extra**	Concentric ring cover of copper **Extra**
31M5	12x12x5½	19¼x14¼x14½	600	**$125.00**	**$15.00**	**$10.00**
31M6	18x12x5½	25¼x14¼x14½	1000	**150.00**	**17.50**	**12.50**
31M7	36x18x9	43¼x20¼x18	2500	**200.00**	**22.50**	**20.00**

Baths, Water, Continued

32M1 Baths, Constant Temperature. For maximum temperature of 60° C. (140° F.). For laboratory applications requiring an accuracy not exceeding ⅒° F.

Low-Drift, Immersion Heating Units, utilizing nickel chromium elements embedded in a matured refractory cement and sheathed in copper tubing, are equipped with solderless terminals enclosed in Bakelite screw caps.

Intermittent Heater is controlled by the relay working in conjunction with the thermo-regulator. Auxiliary heater for higher temperatures or accelerated heat rise is controlled by a switch on the relay cabinet. Operation of the intermittent heater is signaled by a Neon lamp.

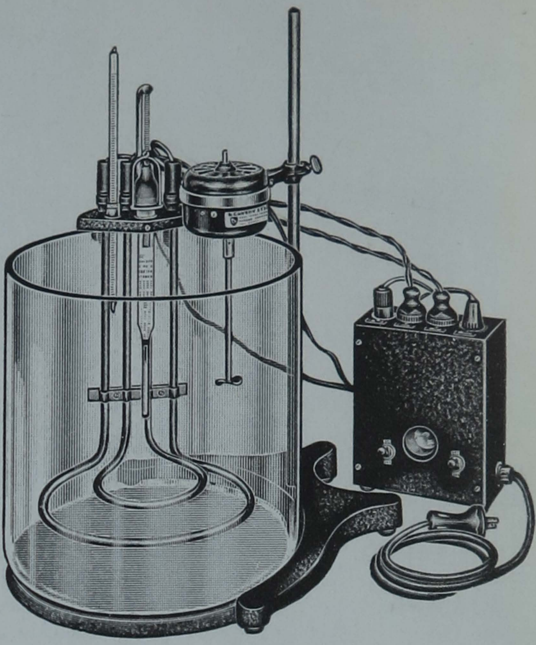
Low Current Super-Sensitive Relay utilizes a magnetic switch with renewable silver contacts. No auxiliary current source is needed as it plugs-in directly on the line.

Mercury Thermo-Regulator, on a spring suspension, has ample overshoot allowance to eliminate repeated resetting of the operating point.

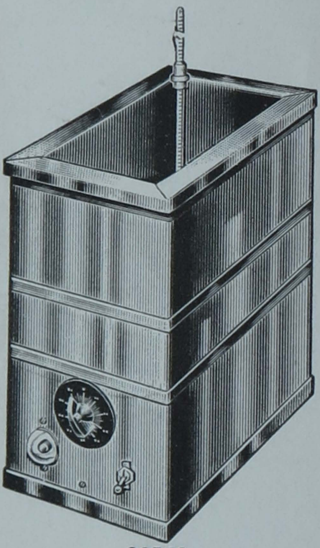
High-Speed Non-Sparking Stirrer, has Monel metal shaft and propeller; runs smoothly and silently. 70 watts current consumptiom. Supplied with rubber covered cord and plug.

Complete with Pyrex glass jar, size 12x12 inches, cork cushion for jar, support base with rubber pads and copper plated support rod, control block with mercury thermo-regulator; Low-Drift Immersion Heating Unit with Bakelite terminals; thermometer ferrule. For 110 volts 50-60 cycle A. C. only.
Each **$85.00**

32M2 Baths, Constant Temperature. Same as 32M1, except maximum temperature 100° C. (212° F.). For 110 volts, 50-60 cycle A. C. only.
Each **$92.00**



32M1



32M3

Baths, Water, Constant Temperature. For serological tests, with adjustable thermostat control and operation at 37° or 56° C. Accuracy, ½° C. for incubations, inactivations, agglutinations, inspissations.

Several units may be lined up into multi-compartment banks, thus adding neatness to the appearance of your room and the saving of much space.

Heavy copper working chamber is double seamed and soldered, producing a smooth unobstructed interior. Around sides and bottom of copper chamber is a ¾-inch thickness of cork to insulate against room temperature fluctuations, and reduce wall losses in promoting temperature control, accuracy and uniformity.

Gleaming, high-lustre polished chrome-plated exterior is practical as well as attractive. It resists tarnish and discoloration, is easy to keep spotlessly clean and bright in keeping with the rest of your laboratory.

Every detail planned for convenience. Sensitive micro switch, terminal leads and pilot lamp receptacle are all mounted within the chrome plated bath housing—out of sight, out of the way. Rubber molding around bottom edge of housing prevents marring of table tops.

A Neon pilot lamp, centigrade thermometer and 6 feet of rubber covered cord with plug are included. Suitable for 110 volts A. C. only. Current consumption, 300 watts. Furnished without cover.

Inside dimensions: Length, 10½ inches; width, 5 inches; depth, 5 inches. Overall dimensions: Length, 12¼ inches; width, 6⅝ inches; height, 12¾ inches.

32M3 Baths, Water. With 2 Army medical racks. **Each** **$60.00**

32M4 Baths, Water. With 1 adjustable Wasserman rack with hangers. **Each** **$59.50**

32M5 Covers, Only. For 32M3 and 32M4 baths. **Each** .... **$ 7.50**

Baths, Water. Same as above, except larger. Current consumption, 500 watts. Inside dimensions: Length, 10½ inches; width, 13½ inches; depth, 5 inches. Overall dimensions: Length, 12⅛ inches; width, 15¼ inches; height, 12¾ inches.

32M6 Baths, Water. With 4 Army medical racks. **Each** **$75.00**

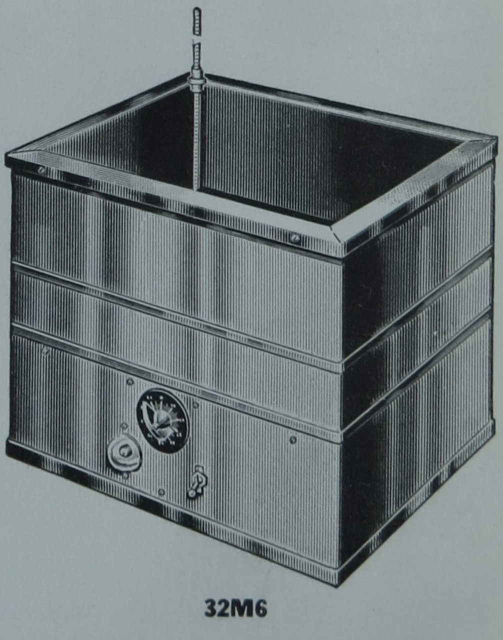
32M7 Baths, Water. With 6 Army medical racks. **Each** **$80.00**

32M8 Baths, Water. With 2 adjustable Wasserman racks with hangers.
Each **$74.00**

32M9 Baths, Water. With 3 adjustable Wasserman racks with hangers.
Each **$78.50**

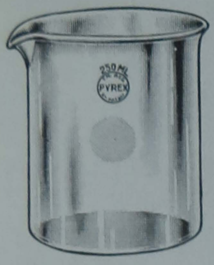
32M10 Baths, Water. With 3 Kahn racks. **Each** **$71.00**

32M11 Covers, Only. For baths, 32M6 to 32M10, inclusive. **Each** **$15.00**

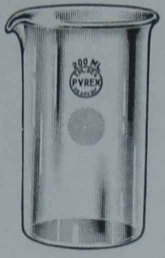


32M6

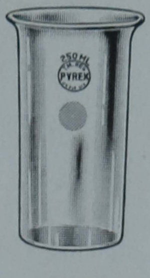
Beakers



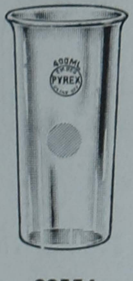
33M1



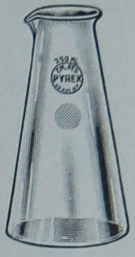
33M2



33M3



33M4



33M5

33M1 Beakers, Pyrex, Griffin. Low Form, with spout.

Capacity, ml.	**30***	**50***	**100**	**150**	**250**	**400**	**600**	**800**	**1000**	**1500**	**2000**	**3000**	**4000**
Quantity in case	120	120	120	120	120	84	72	48	48	24	12	10	10
Each	**$ .17**	**.17**	**.18**	**.19**	**.20**	**.26**	**.31**	**.36**	**.50**	**.73**	**.98**	**1.40**	**1.80**
Case	**$18.36**	**18.36**	**19.44**	**20.52**	**21.60**	**19.66**	**20.09**	**15.55**	**21.60**	**15.77**	**10.58**	**12.60**	**16.20**

*Suitable for micro analysis.

33M2 Beakers, Pyrex, Tall Form, Berzelius, with spout.

Capacity, ml.	**100**	**200**	**300**	**400**	**500**	**600**	**1000**
Quantity in case	120	120	120	60	60	60	36
Each	**$ .18**	**.20**	**.23**	**.26**	**.28**	**.31**	**.50**
Case	**$19.44**	**21.60**	**24.84**	**14.04**	**15.12**	**16.74**	**16.20**

33M3 Beakers, Pyrex, Tall Form, without spout.

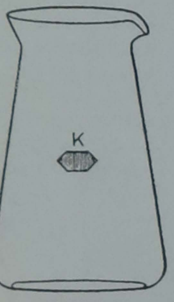
Capacity, ml.	**100**	**200**	**300**	**400**	**500**	**600**	**1000**
Quantity in case	120	120	120	60	60	60	36
Each	**$ .18**	**.20**	**.23**	**.26**	**.28**	**.31**	**.50**
Case	**$19.44**	**21.60**	**24.84**	**14.04**	**15.12**	**16.74**	**16.20**

33M4 Beakers, Pyrex, Electrolytic, Tall Form, without spout.

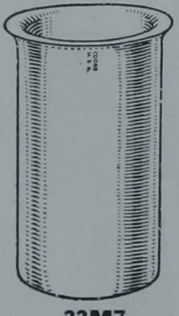
Capacity, ml.	**180**	**250**
Quantity in case	120	96
Each	**$ .23**	**.26**
Case	**$24.84**	**22.46**

33M5 Beakers, Pyrex, Phillips, Conical, with spout.

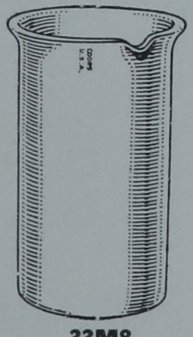
Capacity, ml.	**125**	**250**	**500**
Quantity in case	72	72	48
Each	**$ .22**	**.30**	**.40**
Case	**$14.26**	**19.44**	**17.28**



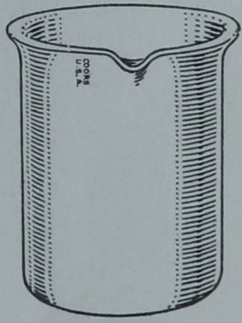
33M6



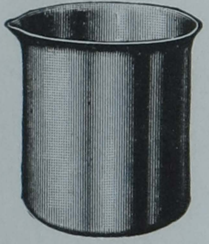
33M7



33M8



33M9



33M10

33M6 Beakers, Phillips, Conical, with spout.

Capacity, ml.	**125**	**250**	**500**
Quantity in case	60	60	60
Each	**$ .20**	**.22**	**.30**
Case	**$10.80**	**11.88**	**16.20**

33M7 Beakers, Coors Porcelain, Tall Form, Without Spout. Glazed inside and outside with exception of outside bottom surface.

Size	**1**	**1A**	**2**	**2A**	**3**
Capacity, ml.	170	250	340	400	580
Diameter rim, mm.	63	70	74	80	92
Diameter body, mm.	53	62	65	70	78
Height, mm.	93	108	118	133	143
Each	**$ .85**	**1.00**	**1.10**	**1.20**	**1.32**
Size—Continued	**3A**	**4**	**5**	**6**	**7**
Capacity, ml.	700	970	1500	2000	5200
Diameter rim, mm.	99	106	125	132	182
Diameter body, mm.	83	93	104	110	165
Height, mm.	154	167	198	209	300
Each	**$1.65**	**2.00**	**2.75**	**4.40**	**12.10**

33M8 Beakers, Coors Porcelain, Tall Form, With Spout. Same specifications as 33M7, except with spout.

Size	1	1A	2	2A	3
Each	**$ .95**	**1.10**	**1.20**	**1.32**	**1.47**
Size	3A	4	5	6	7
Each	**$1.80**	**2.20**	**3.00**	**4.70**	**12.10**

33M9 Beakers, Coors Porcelain, Low Form, with spout. Glazed inside and outside with exception of outside bottom surface.

Size number	**2**	**3**
Diameter of rim, mm.	70	83
Diameter of body, mm.	60	68
Height, mm.	76	86
Capacity, ml.	150	250
Each	**$ .85**	**.85**

33M10 Beakers, Aluminum. Low form, with spout.

Capacity, ml.	**60**	**125**	**250**	**500**	**1000**	**2000**
Diameter, inches	1 9/16	1 7/8	2 1/4	3	3 3/4	4 5/8
Height, inches	2	2 5/8	3 5/8	4 1/2	5 3/8	6 3/4
Each	**$ .75**	**.85**	**1.10**	**1.30**	**1.90**	**3.50**

33M11 Beakers, Copper. Same dimensions as 33M10.

Each	**$ .75**	**.85**	**1.10**	**1.30**	**1.90**	**3.50**

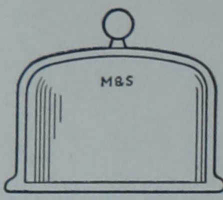
33M12 Beakers, Nickel. Same dimensions as 33M10.

Each	**$2.25**	**3.25**	**4.00**	**5.00**	**5.75**	**10.50**

33M13 Beakers, Monel Metal. Same dimensions as 33M10.
Each . . . . **Furnished on special order only.**

33M14 Beakers, Bakelite, with spout. For use with hydrofluoric acid and similar reagents. Of 1-piece construction.

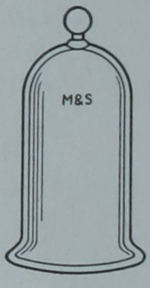
Capacity, ml.	50	100	250
Each	**$5.00**	**6.00**	**9.00**



34M1

34M1 Bell Glasses, Low Form. With knob and ground flange.

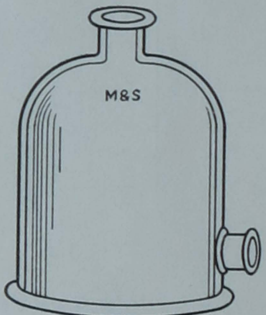
Diam., inside, in.	**3**	**4**	**5**	**6**	**7**	**8**	**10**
Hgt., inside, in.	1½	2¼	3½	4	4½	5	8
Each	**$ .90**	**1.25**	**1.75**	**2.25**	**3.00**	**3.25**	**5.75**



34M2

34M2 Bell Glasses, Tall Form. With knob, and ground flange.

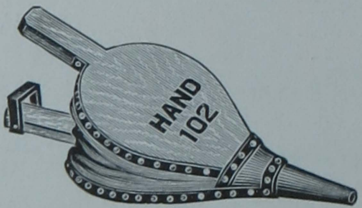
Diam., inside, inches	**3**	**4**	**5**	**6**	**8**	**8½**	**9**	**10**
Hgt., inside, in.	6	8	9	11	13	15	18	18
Capac., gallons	⅛	¼	½	1	2	3	4	5
Each	**$1.35**	**2.00**	**2.50**	**3.50**	**4.75**	**6.50**	**10.00**	**12.00**



34M3

34M3 Bell Glasses. Open top and tubulature near bottom. Wide ground flange. Used with filtering apparatus.

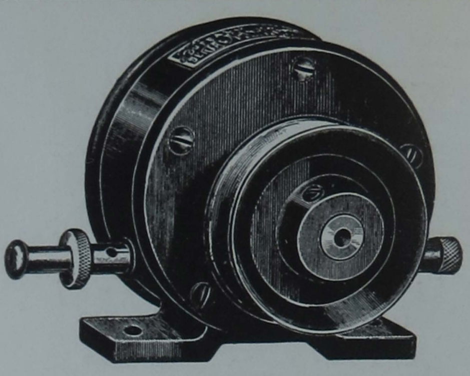
Diameter, inside, inches	**6**	**8**
Height, inside, inches	8	12
Each	**$3.00**	**5.25**



34M4

34M4 Bellows, Hand. Made of light weight, thoroughly dry lumber, covered with a good grade of leather.

Size, inches	10	12
Each	**$2.25**	**3.25**



34M5

34M5 Blowers, Vacuum Pumps, Rotary.

Designed to meet the demand for a small sized blower of positive action and of sufficient capacity to operate ordinary blowpipes, melting furnaces etc.

It consists of a circular housing containing an off center rotor which in turn is slotted to carry blades of an extremely hard composition. Centrifugal force holds these blades in constant contact with the inside circumference of the housing when the blower is in operation, and this action draws the air in at the intake and forces it out at the outlet in a steady stream.

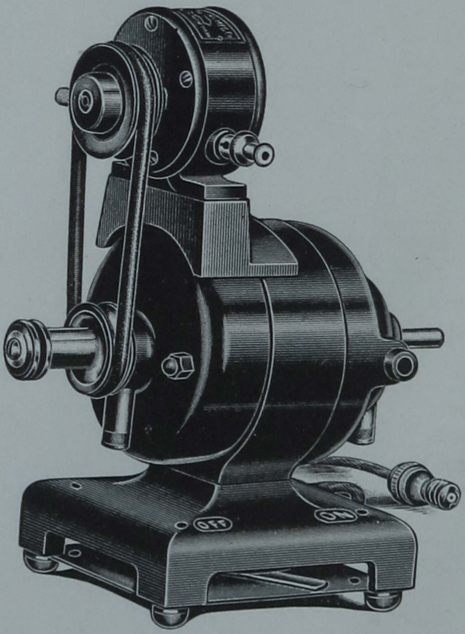
The flow of air can be regulated as to volume by means of the sleeve fitted to the outlet tube.

The blower is usually operated by means of a belt connected to an electric motor, or directly to a line shaft and at 1500 RPM will produce 3 pounds pressure, 1.8 cu. ft. of air per minute, and 7½ inches of vacuum; at 3000 RPM it will produce 5½ pounds pressure, 3.7 cu. ft. air per minute, and 10 inches of vacuum.

Dimensions: 4⅝x3⅜x3¼ inches high.

Blower is equipped with pulley and regularly furnished with three feet of leather belt. Weight, 3 pounds.

Each.. **$12.50**



34M6

34M6 Blowers, Vacuum Pumps, Rotary, Electric.

Motor driven outfit, consists of a 34M5 blower and 1/16 H. P. motor mounted on a neat base.

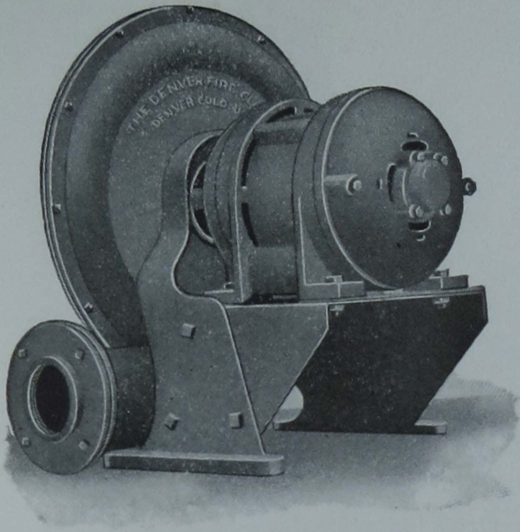
It will appeal to those who desire a sufficient supply of air for ordinary blowpipe work, but do not wish to install an expensive outfit.

It will be found useful in dental and chemical laboratories, jewelers' and machinists' work shops, garages, tool rooms, etc. Weight 8½ pounds.

Supplied for 110 volts, either A. C. or D. C.

Each.. **$49.00**

Blowers, Continued



35M1

Blowers, Electric Motor. Especially designed for use with low pressure oil burners and blast gas burners. Consists of a special high speed, 3450 R.P.M. electric motor with extension shaft, and revolves in a properly designed cast casing. Motor and casing are mounted on a cast iron, steel reinforced bed plate for floor mounting. Casing may be adjusted to discharge in any one of four positions. Starting switches furnished extra at prices specified below. When ordering, always specify catalog and type numbers and current characteristics.

Type	**75**	**125**	**200**	**250**	**500**
Capacity, cubic feet air per minute	100	140	140	400	800
Pressure, air, in. water	6.3	11.1	15.6	15.2	21.9
Horse Power motor	¼	½	¾	1½	5
Weight, ship, pounds	125	200	230	280	525
35M1 With single phase, 110 or 220 volt, 60 cycle A.C. motor. **Each**	**$80.00**	**100.00**	**125.00**	**160.00**	**255.00**
35M2 With 3-phase, 220 or 440 volt, 60 cycle A. C. motor. **Each**	**$80.00**	**100.00**	**125.00**	**140.00**	**200.00**
35M3 With 110 or 220 volt D. C. motor. **Each**	**$80.00**	**100.00**	**125.00**	**185.00**	**275.00**

Direct connected blowers with motors for current characteristics, other than specified above, can be supplied upon special order. Direct connected blowers, however, are not recommended for use with 25-cycle motors.

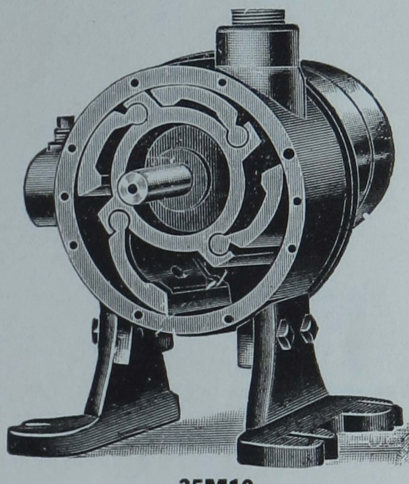
Blower Switches, Enclosed, Hand Lever Operated.

For blowers, type	**75**	**125**	**200**	**250**	**500**
35M4 Single Phase, 110 or 220 volt A. C. **Each**	**$2.90**	**2.90**	**2.90**	**8.00**	**26.00**
35M5 3-phase, 220 or 440 volt A. C. **Each**	**$7.00**	**7.00**	**7.00**	**7.00**	**9.00**
35M6 110 or 220 volt D. C. **Each**	**$14.00**	**14.00**	**14.00**	**26.00**	**26.00**

Blower Switches, Enclosed, Magnetic Operated. With stop-start push buttons. Mounted externally or in cover of switch box.

For blowers, type	**75**	**125**	**200**	**250**	**500**
35M7 Single Phase, 110 volts. **Each**	**$16.00**	**16.00**	**16.00**	**16.00**	**52.00**
35M8 Single phase, 220 volts. **Each**	**$16.00**	**16.00**	**16.00**	**16.00**	**20.00**
35M9 3-phase, 220 or 440 volts. **Each**	**$18.00**	**18.00**	**18.00**	**18.00**	**18.00**

Blowers, Rotary, Pressure or Vacuum Air Pumps, Leiman. Noiseless and rugged in construction. The entire working parts consist only of the piston and wings. Wings are attached to the piston by a hinge-like device producing a very easy action. When in motion the centrifugal force throws and holds out the wings against the cylinder wall. Each wing as it reaches the top is kept close to inner cylinder wall by a pressure stud, thus preventing the air from passing back into the machine, thereby insuring a perfect compression at all times. Wings wear in conformity with inner cylinder wall and maintain a perfect fit and air seal throughout the entire life of the pump.



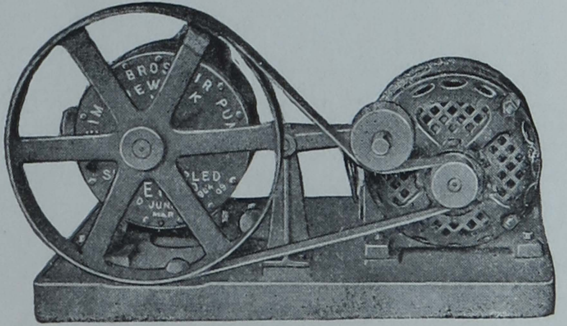
35M10

Type	**25**	**26-1½**	**A**	**B**	**C**
Cu. ft. air, minute	1.2	3.6	6	10	18
Speed in R.P.M., max.	1750	1750	600	600	400
Diam., pulley, in.	2½	5	10	10	12
Size inlet and outlet pipe	¼	⅜	½	¾	1
Weight, approx., lbs.	3	7	16	21	42
Pressure, max. lbs. per square inch	10	10	10	10	10
Vacuum, max. inches mercury	20	20	20	20	20
Horse power required	⅙	⅓	½	¾	1
35M10 Blower Only. With oil cup. Each	**$19.00**	**19.00**	**34.00**	**45.00**	**58.00**

Blowers, Pressure and Vacuum, other than those listed above, for pressure to 25 pounds per square inch and vacuum to 29 inches of mercury can be supplied. Specify pressure or vacuum required.

Accessories for all pumps are extra. Specify whether for pressure or vacuum operation.

Prices on application.

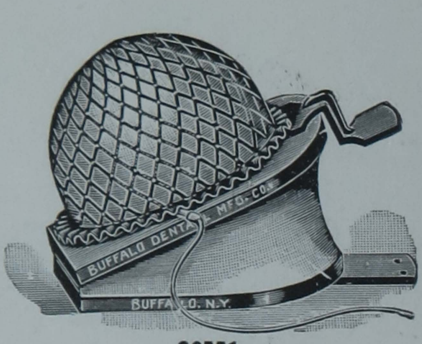


35M11

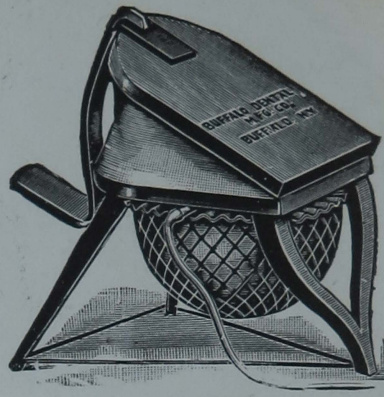
35M11 Blowers, Rotary, Motor Driven. Pressure or Vacuum. Same as 35M10, except motor driven. Types 25 and 26-1½ mounted on base and directly connected to motor by coupling. Types A, B and C mounted on base and connected by belt drive. Regularly furnished with equipment for pressure operation. Furnished with fittings for vacuum operation on request. **When ordering specify current characteristics.**

Type	25	26-1½	A	B	C
Each	**$64.00**	**70.00**	**114.00**	**137.00**	**195.00**

Blowers, Continued



36M1

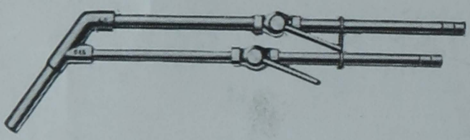

BUFFALO DENTAL MFG. CO.
BUFFALO, N.Y.

36M2

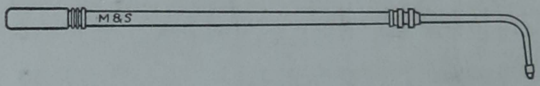
Blowers, Foot. Constructed of best material and workmanship. For use with blowpipes, blast lamps, melting furnaces, etc. Produces a steady blast.

Size	**1**	**2**
Dimensions, board, inches	7¾x9	10x11
Pressure, pounds per square inch	7¼	9
36M1 Blowers, Foot. Without legs. **Each**	**$9.50**	**12.50**
36M2 Blowers, Foot. Mounted on legs. **Each**	**$10.75**	**14.25**
36M3 Extra Rubber Discs. For 36M1 and 36M2 blowers. **Each**	**$ .40**	**.60**

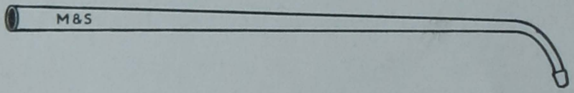
Blowpipes



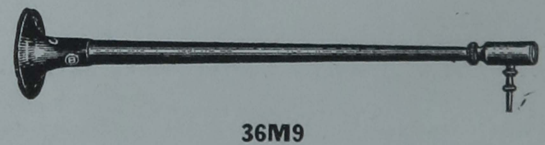
36M4



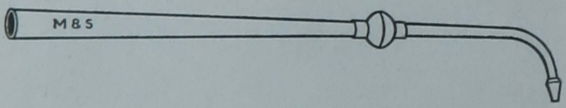
36M8



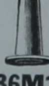
36M6



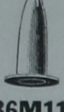
36M9



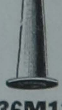
36M7



36M10



36M11



36M12

36M4 Blowpipes. For ⅜-inch gas supply pipe. ⅛-inch air jet, 7⁄16-inch gas opening, with stopcocks. Maximum gas consumption per hour, 42 cubic feet. For artificial gas.
Each **$3.00**

36M5 Blowpipes. Same as 36M4, except for natural gas.
Each **$4.00**

36M6 Blowpipes. Made of brass; plain.

Length, inches	8	10
Each	**$ .15**	**.20**

36M7 Blowpipes. Made of brass; with bulb.

Length, inches	8	10
Each	**$ .25**	**.25**

36M8 Blowpipes. School of Mines Pattern. With moisture trap. Made of brass with bone mouthpiece. **Each** **$1.00**

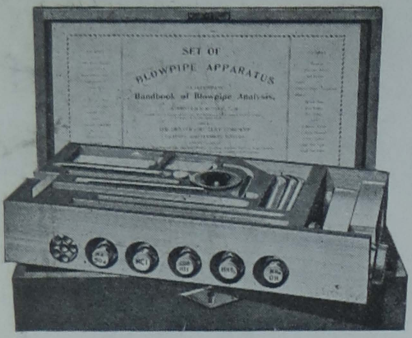
36M9 Blowpipes, Plattner. Nickel plated with mouthpiece. Furnished with plain metal tip. For platinum tips, see below.
Each **$2.50**

36M10 Blowpipe Tips, Platinum. Approximate weight, 0.50 grams. **Each** **$4.75**

36M11 Blowpipe Tips, Platinum. Approximate weight, 0.80 grams. **Each** **$6.00**

36M12 Blowpipe Tips, Platinum. Approximate weight, 0.50 grams. **Each** **$4.75**

Blowpipe Sets



37M1

37M1 Blowpipe Sets, Portable, Butler's. This collection of apparatus and reagents for blowpipe work was assembled for Prof. G. Montague Butler, Dean of the College of Mines and Engineering, University of Arizona, as being amply complete and yet susceptible of compact arrangement so as to be readily portable for field use, when desired. Each part fits into its own receptacle or compartment, and breakage is thus reduced to a minimum. The liquid chemicals are in glass-stoppered bottles plainly labeled, and the dry chemicals are furnished in tin boxes, with sifting tops. Outside measurements of case: 11¾x6½x2¾ inches. Complete with wet and dry fluxes, and oil and alcohol for the lamps. The set contains the following:

Blowpipe
Platinum wires and holder
Combination Charcoal Borer
Magnet and Chisel
Streak Plate
Blue Litmus
Red Litmus
Anvil
3 Arsenic Tubes
2 Sticks Charcoal
6 Open Tubes
Large Test Tube
Small Test Tube
Ammonium Hydrate
Cobalt Nitrate
Hydrochloric Acid
Sulphuric Acid
Nitric Acid
Tin
Microscosmic Salt
Sodium Carbonate
Bismuth Flux
Borax
Potassium Bisulphate
Oil Lamp (Brass)
Alcohol Lamp (Brass)
Hammer
Platinum-tipped Forcep

Set Complete. Each............................**$28.00**

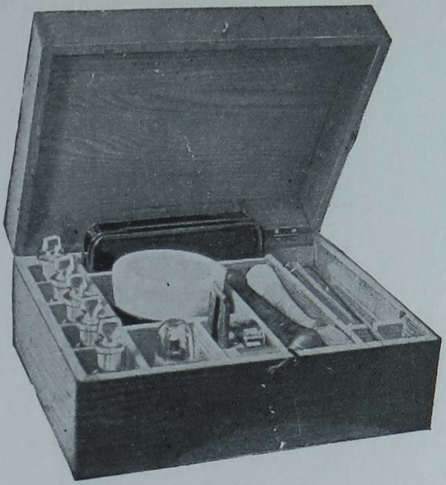
37M2

37M2 Blowpipe Sets, Portable. Smaller style for mineralogy classes, as used by schools of mines. Complete with reagents. In wood case.

The set contains the following:

Hammer
Anvil
Blowpipe
Horseshoe Magnet 2½ inches
Oil Lamp
Streak Plate
2 Charcoal Sticks
6 Arsenic Tubes, Bent
Book Tumeric Paper
Slag Forceps
Platinum Wire, 2 inches
Ammonium Hydrate
Cobalt Nitrate
Hydrochloric Acid
Sulphuric Acid
Nitric Acid
Microscosmic Salt
Sodium Carbonate
Bismuth Flux
Borax
Potassium Bisulphate

Set Complete. Each............................**$7.50**



37M3

37M3 Blowpipe Test Sets. Consists of a fusion mixture with which the ore to be tested is mixed and ignited. An intense heat and reducing action is developed and metals in chemical combination are reduced to their metallic state.

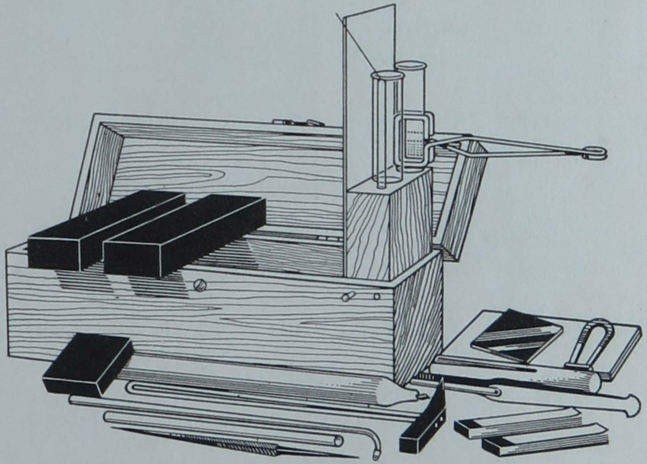
After combustion the residue is crushed and the metals separated from the slag by washing. They can then be identified by color or by further testing with acids as explained in instructions furnished with each set.

Set consists of the following:

Box Fusion Mixture (20 tests)
Porcelain Mortar
Iron Mortar
Magnifying Glass
5 Glass Stoppered Bottles
Magnet
Funnel and Filter Papers
3 Test Tubes
Alcohol Lamp
Blowpipe and Charcoal Stick

Set complete in wood case............................**$10.00**

37M4 Pocket Smelters, Reduco Fusion Mixture. Same as furnished with 37M3. In tin box, containing 20 fusions.
Box............................**$1.00**



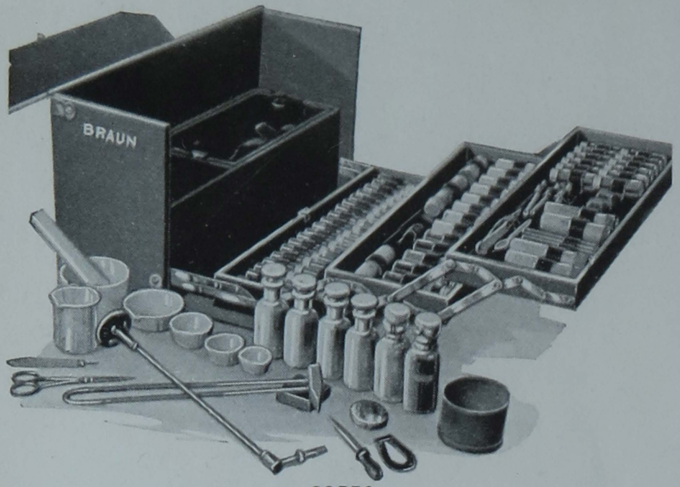
37M5

37M5 Blowpipe Sets, Students'. In wood box 8 inches long, 3 inches wide, 4¼ inches high, with built-in test tube support. Contains the following:

Anvil
Horseshoe Magnet, 2 inches
Forceps, 5 inches
Wood Forceps Clamp
Triangular File, 3 inches
Test Tube Clamp, 4½ inches
Plain Blowpipe, 8 inches
All Metal Blowpipe Hammer
Candle
2 Charcoal Sticks
2 Test Tubes, ⅝x5 inches
Square Cobalt Glass
Glass Tube ¼x5 inches
Porcelain Streak Plate
Book each Red and Blue Litmus Paper
Platinum Wire in Glass Handle, 1½ inches

Set complete. Each............................**$3.50**

Blowpipe Sets, Continued



38M1

38M1 Blowpipe Test Sets. For making complete qualitative determinations of minerals in the field. Packed in carrying case 16 inches long, 8 inches high, 6 inches wide. Weight is 18 pounds. Supplied with lock and key. The case opens as shown in illustration and contains necessary equipment and reagents for making tests in accordance with methods given by J. D. Dana in his textbook, "A System of Mineralogy."

Set includes the following equipment:

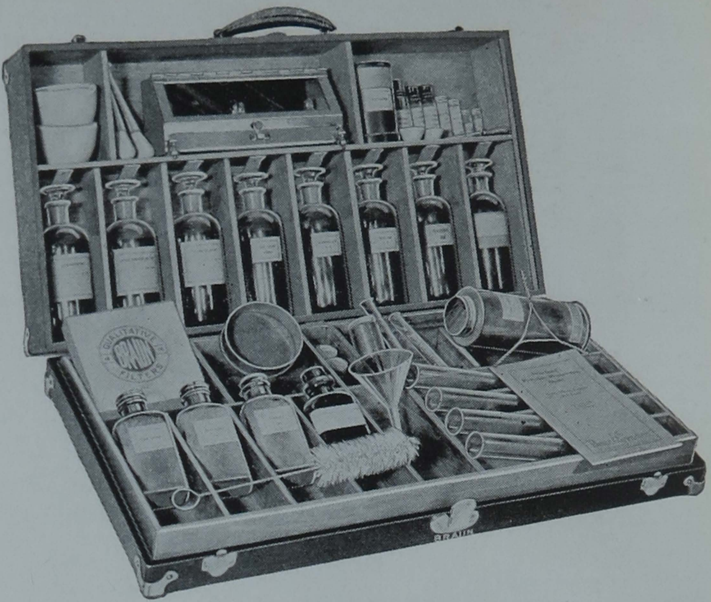
1 Anvil, polished steel
2 Plattner's Blowpipe
3 Porcelain Mortar and Pestle
4 Alcohol Lamp
5 Beaker
6 Charcoal Block
7 Evaporating Dish
8 Porcelain Crucibles
9 Forceps, 5-inch
10 Forceps, Nichrome Tips
11 Hammer
12 Horseshoe Magnet
13 Pipette
14 Platinum Wire Holder
15 3 pieces Platinum Wire
16 Scissors
17 Horn Spoon
18 Test Lead Measure
19 3 Open Glass Tubes
20 3 Closed Glass Tubes
21 Magnifier, 1-inch
22 Blue Litmus Paper
23 Red Litmus Paper
24 Tumeric Paper
25 Brazil Wood Paper
26 Borax Glass
27 Borax Powder
28 Bone Ash
29 Antimony Oxide
30 Arsenous Acid
31 Salt Phosphorus
32 Soda Carbonate
33 Soda Nitrate
34 Alcohol
35 Ammonia Hydroxide
36 Hydrochloric Acid
37 Copper Oxide
38 Iron Oxide
39 Lead Oxide
40 Manganese Oxide
41 Mercury Oxide
42 Potash Bisulphate
43 Test Lead
44 Tin Oxide
45 Cobalt Nitrate Sol.
46 Nitric Acid
47 Sulphuric Acid

Set complete. Each.......................... **$38.50**

38M2 Blowpipe Test Sets. Same as 38M1, except that it contains in addition, the following 50 mineral samples for comparison:

1 Graphite
2 Sulphur
3 Stibnite
4 Chalcopyrite
5 Galenite
6 Rutile
7 Pyrrhotite
8 Pyrite
9 Hematite
10 Magnetite
11 Chromite
12 Limonite
13 Siderite
14 Pyrolusite
15 Rhodonite
16 Sphalerite
17 Willemite
18 Corundum
19 Cryolite
20 Fluorite
21 Calcite
22 Apatite
23 Gypsum
24 Dolomite
25 Barite
26 Magnesite
27 Celestite
28 Strontianite
29 Halite
30 Quartz
31 Orthoclase
32 Witherite
33 Albite
34 Spodumene
35 Hornblende
36 Wollastonite
37 Beryl
38 Garnet
39 Mica
40 Lepidolite
41 Chrysolite
42 Scapolite
43 Tourmaline
44 Cyanite
45 Pyrophylite
46 Talc
47 Datolite
48 Prehnite
49 Pectolite
50 Stilbite

Set complete. Each.......................... **$44.00**



38M3

38M3 Prospecting Outfits, Pritchard. Provides a means for making a very close approximate assay for gold, silver, copper or lead. The outfit, which weighs only 20 pounds, can be readily carried in the field.

Easy to Use: You need no knowledge of chemistry to make accurate assays. A book of instructions furnished with each set gives simple and explicit instructions for making gold, silver, copper and lead assays according to standard laboratory practice.

Complete Equipment: All equipment necessary for making complete assays is included in each set. Sufficient chemicals for 150 assays are supplied, each in a clearly labeled container.

Gold Button: The Pritchard Chemical Process is practically the only method outside of the fire assay that produces a gold button which, when accurately weighed, will give a close approximate value of the gold content of the ore. By using this process the prospector can quickly decide upon the value of a prospective location, since he can determine the value of even low grade ores without a laboratory assay.

Precision Balance: The improved combination pulp and button balance is a gem of ingenious design. It is small, yet the button balance is sensitive to 1/100 of a milligram and the pulp balance to 1 milligram. The button balance will take a button up to 5 milligrams. (1 mg. indicating 3 Troy ounces of gold per ton of ore.) The pulp balance has a capacity of 30 grams. This balance is illustrated on page 9.

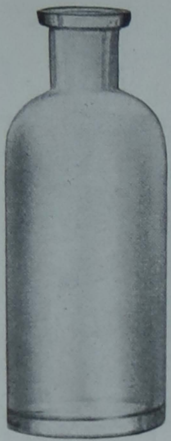
The set must be shipped by express or freight since the acids and chemicals included cannot be shipped by Parcel Post.

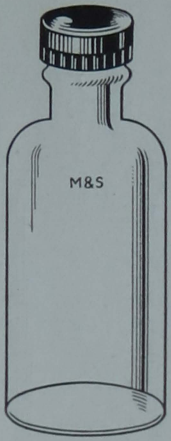
Complete for gold, silver, copper and lead assays, with book of instructions, in suitable carrying case, 24x10½x15½ inches. Net weight, 20 pounds. **Each**.................... **$80.00**

38M4 Instruction Books. Give complete description of Pritchard Prospecting Outfit and complete directions for use. **Each**.................................. **$ .75**

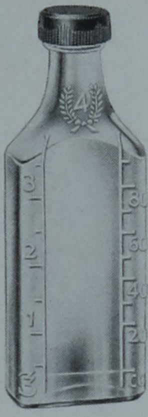
For Mineral Collections, see pages 271 and 272.
For Portable Fire Assay Outfit, see page 403.

Bottles

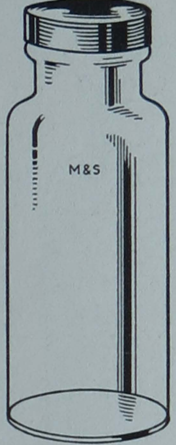

39M1



39M2


39M3

39M4



39M5

39M1 Bottles, Narrow Mouth, Round. Flint glass, for cork stoppers.

Capacity, ounces	**1**	**2**	**3**	**4**	**6**	**8**	**12**	**16**	**32**
Cork size	2	3	4	5	5	6	6	6	8
Each	**$ .03**	**.04**	**.04**	**.04**	**.04**	**.05**	**.06**	**.07**	**.10**
Dozen	**$ .32**	**.36**	**.42**	**.44**	**.45**	**.54**	**.68**	**.72**	**1.13**

39M2 Bottles, Narrow Mouth, Round. Flint glass, with molded screw caps.

Capacity, ounces	1	2	4	6	8	12	16	32
Each	**$ .04**	**.04**	**.05**	**.05**	**.06**	**.08**	**.09**	**.15**
Dozen	**$ .41**	**.45**	**.50**	**.54**	**.68**	**.82**	**.90**	**1.58**

39M3 Bottles, Graduated Prescription. Flint glass, with molded screw caps.

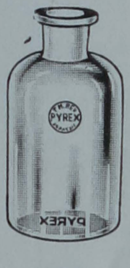
Capacity, ounces	½	1	2	3	4	6	8	12	16	32
Dozen	**$ .40**	**.45**	**.48**	**.50**	**.55**	**.64**	**.75**	**.92**	**1.10**	**1.70**

39M4 Bottles, Wide Mouth, Round. Flint glass, for cork stoppers.

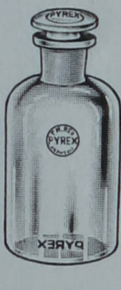
Capacity, ounces	**½**	**1**	**2**	**3**	**4**	**6**	**8**	**12**	**16**	**32**
Cork size	6	10	11	14	15	15	20	19	22	28
Each	**$.03**	**.03**	**.04**	**.04**	**.04**	**.04**	**.05**	**.06**	**.07**	**.13**
Dozen	**$.27**	**.32**	**.36**	**.42**	**.44**	**.45**	**.54**	**.65**	**.72**	**1.35**

39M5 Bottles, Wide Mouth, Round. Flint glass, with metal screw caps.

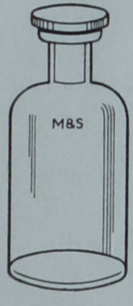
Capacity, ounces	4	6	8	16
Each	**$ .07**	**.09**	**.12**	**.18**
Dozen	**$ .70**	**.90**	**1.20**	**1.80**



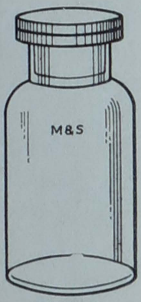
39M8



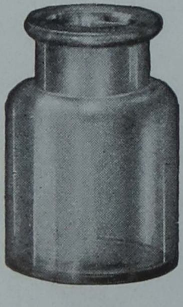
39M9

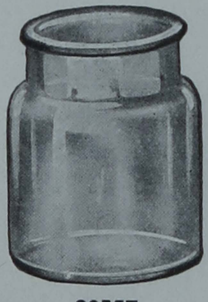


39M10



39M11


39M6


39M7

39M6 Bottles, Wide Mouth Specimen. Flint glass, for cork stoppers.

Capacity, ounces	**1⅜**	**2½**	**3½**
Height over all, mm.	68	72	78
Outside diameter, mm.	40	49	56
Inside diameter of neck, mm.	23	25	33
Each	**$ .09**	**.11**	**.13**
Dozen	**$1.00**	**1.20**	**1.40**

39M7 Bottles, Extra Wide Mouth Specimen. Flint glass.

Capacity, ounces	**1**	**1⅔**	**3⅓**	**5**
Capacity, ml.	30	50	100	150
Height over all, mm.	53	60	71	84
Outside diameter, mm.	43	49	60	66
Inside diameter of neck, mm.	26	26	41	41
Each	**$ .09**	**.10**	**.12**	**.15**
Dozen	**$ .90**	**1.13**	**1.35**	**1.58**

39M8 Bottles, Reagent, Pyrex, without stoppers.

Capacity, ml.	**60**	**125**	**250**	**500**	**1000**	**2000**	**4000**
Quan. in case	96	48	48	48	24	18	10
Dia., mm.	40	55	65	83	105	127	175
Height, mm.	87	110	130	162	200	241	285
Each	**$ .15**	**.20**	**.35**	**.50**	**.70**	**1.00**	**1.70**
Case	**$12.96**	**8.64**	**15.12**	**21.60**	**15.12**	**16.20**	**15.30**

39M9 Bottles, Reagent, Pyrex, with stoppers.

Capacity, ml.	**60**	**125**	**250**	**500**	**1000**	**2000**	**4000**
Quan. in case	48	48	36	24	24	12	6
Diameter mm.	40	55	65	83	105	127	175
Height, mm.	97	118	140	172	210	251	295
Each	**$ .50**	**.55**	**.80**	**1.00**	**1.40**	**1.90**	**3.00**
Case	**$21.60**	**23.76**	**25.92**	**21.60**	**30.24**	**20.52**	**16.20**

39M10 Bottles, Metric Shelf, Narrow Mouth. With ground glass hood stopper, flint glass.

Capacity, ml.	30	60	125	250	500	1000
Each	**$ .25**	**.27**	**.31**	**.38**	**.46**	**.75**
Dozen	**$2.70**	**2.92**	**3.38**	**4.05**	**4.95**	**8.10**

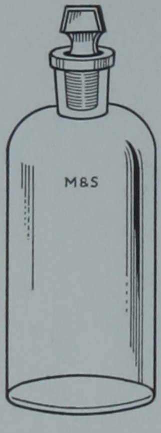
39M11 Bottles, Metric Shelf, Wide Mouth. With ground glass hood stopper, flint glass.

Capacity, ml.	30	60	125	250	500	1000
Each	**$ .27**	**.28**	**.32**	**.39**	**.48**	**.77**
Dozen	**$2.88**	**3.06**	**3.50**	**4.23**	**5.15**	**8.32**

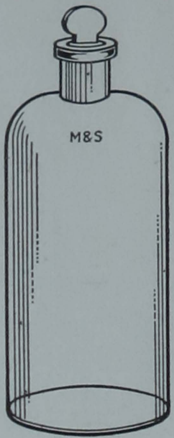
Bottles, Continued

40M1

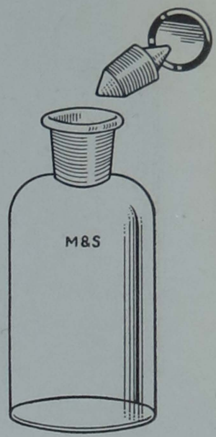
40M2



40M3



40M5



40M6

40M1 Bottles, Narrow Mouth, Round, Glass Stoppered. Flint glass, with mushroom stoppers.

Size	1 oz.	2 oz.	4 oz.	8 oz.	16 oz.	32 oz.	½ gal.	1 gal.	2 gal.
Each	**$ .25**	**.27**	**.31**	**.39**	**.50**	**.64**	**1.40**	**1.75**	**6.00**
Dozen	**$2.70**	**2.88**	**3.34**	**4.23**	**5.30**	**6.92**	**15.12**	**19.00**	**65.00**

40M2 Bottles, Wide Mouth, Round, Glass Stoppered. Flint glass, with mushroom stoppers.

Size, ounces	1	2	4	6	8	12	16	32	64
Each	**$ .27**	**.28**	**.31**	**.35**	**.41**	**.50**	**.52**	**.66**	**1.06**
Dozen	**$2.93**	**3.06**	**3.34**	**3.82**	**4.40**	**5.30**	**5.62**	**7.10**	**11.50**

40M3 Bottles, Narrow Mouth Tincture, Glass Stoppered. Flint glass, with square head stoppers.

Size, ounces	1	2	4	6	8	12	16	32
Each	**$ .25**	**.27**	**.31**	**.34**	**.39**	**.48**	**.50**	**.64**
Dozen	**$2.70**	**2.88**	**3.34**	**3.70**	**4.23**	**5.14**	**5.30**	**6.92**

40M4 Bottles, Narrow Mouth Tincture, Glass Stoppered, Amber. Same as 40M3 but amber glass.

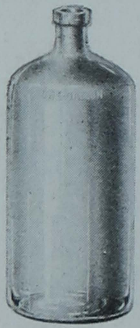
Size, ounces	1	2	4	8	16	32
Each	**$ .25**	**.27**	**.30**	**.39**	**.50**	**.69**
Dozen	**$2.70**	**2.88**	**3.20**	**4.20**	**5.45**	**7.43**

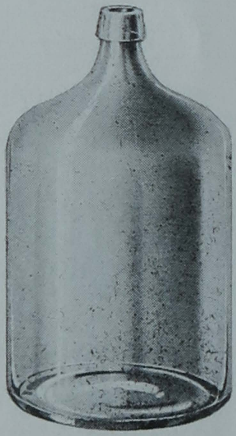
40M5 Bottles, Acid, Glass Stoppered, light green glass. (5 pint size is so-called "Winchester" Bottle.)

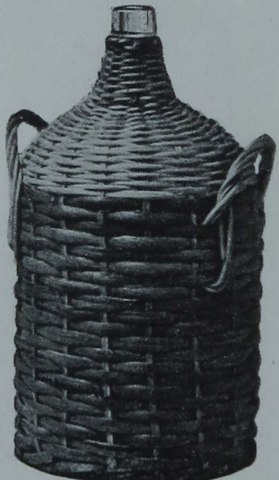
Capacity	1 pt.	5 pts.	1 gal.
Each	**$ .40**	**.50**	**1.25**

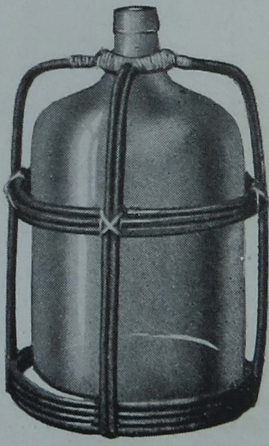
40M6 Bottles, B. O. D., designed especially for the determination of bio-chemical oxygen demand (B. O. D.) of water as outlined in Supplement Number 90, U. S. Public Health Service. A low form, clear glass bottle, with special lip on neck for water seal; equipped with slightly pointed, accurately fitting glass stopper. Each bottle has a "frosted" panel for marking. Bottles and stoppers are individually and consecutively numbered in bold black enamel, fired on.

Capacity	**300 ml.**
Diameter of body	68 mm.
Height over all, including stopper	165 mm.
Each	**$1.25**
Dozen	**$11.25**


40M7


40M8


40M9


40M10

40M7 Bottles, Solution, Pyrex. For cork stoppers.

Capacity, gallons	2½	3½	5	12
Each	**$3.00**	**3.50**	**4.00**	**7.50**

40M8 Bottles, Narrow Mouth, Large. Light green glass, for cork stoppers.

Capacity, gallons	½	1	2	3	5
Each	**$ .25**	**.35**	**1.00**	**1.25**	**1.75**

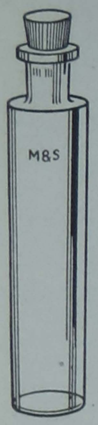
40M9 Bottles, Wicker Covered.

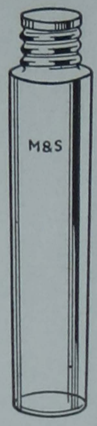
Capacity, gallons	1	2	3	5
Each	**$1.50**	**1.75**	**2.00**	**2.50**

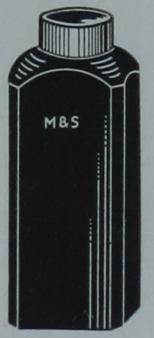
40M10 Bottles, Skeleton Frame Covered.

Capacity, gallons	1	2	3	5
Each	**$2.25**	**2.50**	**2.75**	**3.50**

Bottles, Continued


41M1


41M4


41M6

41M1 Bottles, Oil Sample—For Corks. Made of seamless, crystal clear glass, square shoulders, **plain bottoms.** Furnished with corks.

Capacity, ounces	4	8
Dozen	**$1.75**	**2.50**

41M2 Bottles, Oil Sample—For Corks. Same as 41M1, except with **ground and polished bottoms.** Capacity, 4 ounces. **Dozen** **$2.25**

41M3 Bottles, Oil Sample, Plain Bottom—For Corks. Similar to 41M1, except that they are regular molded glass bottles. Furnished with corks. Capacity, 4 ounces.
Dozen .... **$ .75**

41M4 Bottles, Oil Sample, Screw Cap. Furnished with cork-lined metal screw caps. Capacity, 4 ounces.
Dozen **$2.00**

41M5 Bottle Mailing Cases. For oil sample bottles of sizes shown:

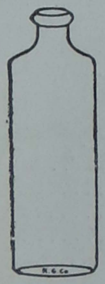
For size bottles, ounces	4	8
Dozen	**$1.62**	**2.00**

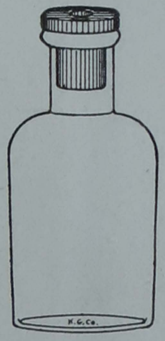
41M6 Bottles, Hard Rubber. For hydrofluoric acids, etching solutions, frosting compounds, etc.

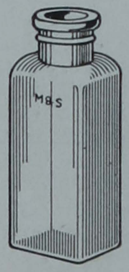
Size, ounces	4	8	16
Each	**$ .90**	**1.00**	**1.25**

41M7 Bottles, Bakelite. For hydrofluoric acid and other reagents which attack glass.

Capacity, ml	50	100	250
Each	**$10.00**	**12.00**	**18.00**


41M8


41M10


41M12

41M8 Bottles, Serum. Non-corrosive glass without stoppers.

Capacity, ml	1	2	5	10	20
Gross	**$3.00**	**3.00**	**3.50**	**4.25**	**7.50**

41M9 Rubber Stoppers for above bottles. State size wanted.
Gross **$1.50**

41M10 Bottles, Serum, U. S. Army Medical Corps Type. Non-corrosive glass, without stoppers.

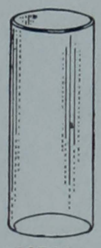
Capacity, ml	15	30	60	100
Dozen	**$1.90**	**2.05**	**2.50**	**3.10**

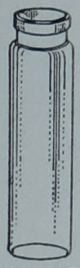
41M11 Rubber Stoppers for above bottles. State size wanted
Gross **$4.00**

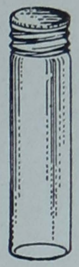
41M12 Bottles, Vaccine, Amber Glass, Square. Without stoppers.

Capacity, ml	15	30
Dozen	**$ .50**	**.60**

41M13 Rubber Caps for above. **Dozen** .... **$ .40**


41M14


41M15


41M16

41M14 Bottles, Shell Vials. Made of clear glass with straight sides and flat bottom. Without corks.

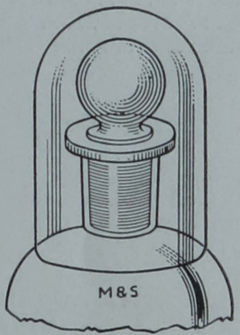
Capacity, drams	**1**	**2**	**3**	**4**	**6**	**8**
Height, mm	45	60	65	70	85	95
Diameter, mm	15	17	19	21	23	25
Cork size	4	5	6	7	9	10
Dozen	**$ .15**	**.15**	**.20**	**.30**	**.40**	**.50**
Gross	**$1.44**	**1.44**	**1.50**	**1.90**	**2.30**	**3.00**

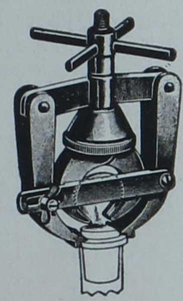
41M15 Bottles, Specimen Vials. Homeopathic. Made of clear glass with square lip and flat top. Without corks.

Capacity, drams	**½**	**1**	**2**	**4**	**6**	**8**
Height, mm	35	45	60	70	85	95
Diameter, mm	12	15	17	21	23	25
Cork size	0	2	3	5	5	6
Dozen	**$ .12**	**.13**	**.17**	**.33**	**.44**	**.50**
Gross	**$1.20**	**1.30**	**1.60**	**3.20**	**4.10**	**4.80**

41M16 Bottles, Specimen Vials. Made of clear glass with cork-lined metal **screw caps.**

Capacity, drams	**1**	**2**	**4**	**6**	**8**
Height, mm	45	60	70	85	95
Diameter, mm	15	17	21	23	25
Dozen	**$ .30**	**.40**	**.50**	**.70**	**1.00**
Gross	**$2.88**	**3.84**	**4.80**	**6.72**	**9.60**


41M17


41M18

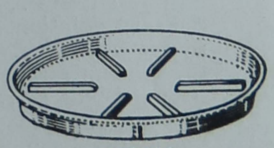
41M17 Bottle Caps, Glass. To protect stoppers and mouths of bottles from dust. For narrow mouth bottles.

For bottle size, ounces	4	8	16	32
Each	**$ .20**	**.20**	**.25**	**.35**

41M18 Bottle Stopper Remover, or Puller. Will easily remove stubborn or fast sticking stoppers from reagent bottles; will handle a wide range of bottles with neck flanges from 1 to 2 inches in diameter. **Each** **$6.50**

41M19 Bottle Rests, Coors Porcelain. Glazed inside and outside, with exception of bottom.

Dia., inside bottom, mm.	67	90	120
Each	**$ .45**	**.70**	**1.35**


41M19

Bottles, Reagent

ACID
NITRIC
HNO3

42M2—No. 5

Bottles, Narrow Mouth Reagent:

Made from a special formula, prepared by an eminent American Chemist. They are much harder and more brilliant than the ordinary bottle glass and will show no free alkali. The glass stoppers are well ground to fit each individual bottle.

The chemical names and equivalents are blown in the glass. The surface of the letters in each bottle is ground off to make them more legible. By using this bottle the danger of confusion and unsightly appearance of paper labeled bottles is done away with.

When ordering, the number may be used instead of writing the full name of the bottle.

42M1, Capacity, 1 ounce (30 ml.). Height 3⅛ inches.

No.	Name	Symbol
326	Cobaltous Nitrate	$Co(NO_3)_2$
336	Gold Chloride	$AuCl_3$
327	Platinic Chloride	$PtCl_4$
325	Silver Nitrate (Amber)	$AgNO_3$
41	Blank	

Each, $ .40. Dozen **$4.00**

42M2, Capacity, 4 ounce (¼ Pint) (125 ml.). Height, 5¼ inches.

No.	Name	Symbo
3	Acetic Acid	$HC_2H_3O_2$
30	Alcohol	C_2H_5OH
77	Ammonia	NH_3
439	Ammonium Acetate	$NH_4C_2H_3O_2$
18	Ammonium Carbonate	$(NH_4)_2CO_3$
17	Ammonium Chloride	NH_4Cl
15	Ammonium Hydroxide	NH_4OH
440	Ammonium Hydroxide, Con	NH_4OH
441	Ammonium Hydroxide, Dil	NH_4OH
82	Ammonium Molybdate	$(NH_4)_6MO_7O_{24}$
19	Ammonium Oxalate	$(NH_4)_2C_2O_4$
16	Am. Sulphide (Amber)	$(NH_4)_2S$
31	Am. Sulphocyanide	NH_4CNS
97	Am. Sulphydrate	NH_4HS
33	Barium Carbonate	$BaCO_3$
20	Barium Chloride	$BaCl_2$
32	Barium Hydroxide	$Ba(OH)_2$
401	Barium Nitrate	$Ba(NO_3)_2$
437	Benedict Solution	
436	Biuret Reagent	
426	Bromine for Hypo-Bromite	
406	Bromine Water	
21	Calcium Chloride	$CaCl_2$
434	Calcium Hydrate	CaH_2O_2
23	Calcium Hydroxide	$Ca(OH)_2$
22	Calcium Sulphate	$CaSO_4$
83	Carbon Disulphide	CS_2
433	Carbon Tetrachloride	CCl_4
407	Chloroform	$CHCl_3$
408	Cochineal	
409	Coralline	
36	Cupric Sulphate	$CuSO_4$
421	Dimethyl Glyoxime	$(CH_3)_2C_2(NOH)_2$
646	Esbach's Reagent	
35	Ether	$(C_2H_5)_2O$
58	Fehling's Solution	
29	Ferric Chloride	$FeCl_6$
28	Ferrous Sulphate	$FeSO_4$
2	Hydrochloric Acid	HCl
419	Hydrochloric Acid, Con.	HCl
429	Hydrochloric Acid, Dil.	HCl
428	Hydrogen Peroxide	
1	Hydrogen Sul. (Amber)	H_2S
87	Indigo Solution	
414	Iodine Solution	$I+KI$
27	Lead Acetate	$Pb(C_2H_3O_2)_2$
410	Litmus	
90	Magnesia Mixture	
438	Magnesium Chloride	$MgCl_2$
24	Magnesium Sulphate	$MgSO_4$
25	Mercuric Chloride	$HgCl_2$
100	Mercuric Potass. Iodide	
86	Mercurous Nitrate	$Hg_2(NO_3)_2$
415	Methyl Alcohol	CH_3OH
411	Methyl—Orange	
435	Millon's Reagent	
88	Nessler's Solution	
5	Nitric Acid	HNO_3
422	Nitric Acid, Con.	HNO_3
430	Nitric Acid, Dil.	HNO_3
425	Obermayer's Reagent	
93	Oxalic Acid	$H_2C_2O_4$
423	Phenol	C_6H_5OH
412	Phenolphthalein	
94	Picric Acid	$C_6H_2OH(NO_2)_3$
37	Platinic Chloride	$PtCl_4$
8	Potassium Carbonate	K_2CO_3
96	Potassium Chromate	K_2CrO_4
432	Potassium Cyanide	KCN
13	Potassium Dichromate	$K_2Cr_2O_7$
11	Potassium Ferricyanide	$K_3Fe(CN)_6$
6	Potassium Ferrocyanide	$K_4Fe(CN)_6$
12	Potassium Hydroxide	KOH
10	Potassium Iodide	KI
9	Potassium Sulphate	K_2SO_4
7	Potass. Sulphocyanide	$KCNS$
26	Silver Nitrate (Amber)	$AgNO_3$
404	Silver Sulphate	Ag_2SO_4
60	Sodium Acetate	$NaC_2H_3O_2$
59	Sodium Carbonate	Na_2CO_3
416	Sodium Cobaltic Nitrite	
61	Sodium Hydroxide	$NaOH$
427	Sod. Hydrox. for Hypo-Bromite	$NaOH$
14	Sodium Phosphate	Na_2HPO_4
417	Sodium Thiosulphate	$Na_2S_2O_3$
81	Stannous Chloride	$SnCl_2$
4	Sulphuric Acid	H_2SO_4
420	Sulphuric Acid, Con	H_2SO_4
431	Sulphuric Acid, Dil	H_2SO_4
424	Tinct. Guaiac	
413	Tumeric	
56	Uranium Acetate	$UO_2(C_2H_3O)_2$
38	Blank	

Each, $ .48. Dozen **$4.75**

42M3 Narrow Mouth Reagent Bottle Sets.

This set consists of 40 narrow mouth, 4 ounce reagent bottles with raised ground glass letters. It has been selected to cover the requirements of the chemists using the regular run of reagents ordinarily used in the average laboratory.

This set includes bottle numbers 1 to 33, inclusive, numbers 35, 36, 59, 61 and 3 number 38 blanks. **Set** **$15.83**

Bottles, Reagent, Continued

Bottles, Narrow Mouth Reagent (Continued).

43M1. Capacity, 8 ounce (½ pint) (250 ml.) height 6½ inches.

Number	Name	Symbol
131	Acetic Acid	$HC_2H_3O_2$
178	Acetic Acid, Dil.	$HC_2H_3O_2$
126	Alcohol	C_2H_5OH
157	Ammonia	NH_3
161	Ammonium Hydrate	$(NH_4)HO$
110	Ammonium Carbonate	$(NH_4)_2CO_3$
109	Ammonium Chloride	NH_4Cl
108	Ammonium Hydroxide	NH_4OH
176	Ammonium Hydroxide, Dil.	NH_4OH
177	Ammonium Hydroxide, Con.	NH_4OH
155	Ammonium Molybdate	$(NH_4)_6Mo_7O_{24}$
130	Ammonium Oxalate	$(NH_4)_2C_2O_4$
158	Ammonium Phosphate	$(NH_4)_2HPO_4$
122	Am. Sulphide (Amber)	$(NH_4)_2S$
163	Barium Acetate	$Ba\ (C_2H_3O_2)_2$
114	Barium Chloride	$BaCl_2$
179	Benzene	C_6H_6
151	Calcium Hydroxide	$Ca(OH)_2$
159	Ether	$(C_2H_5)_2O$
154	Ferrous Sulphate	$FeSO_4$
162	Hydrochloric Acid	HCl
105	Hydrochloric Acid, Con.	HCl
106	Hydrochloric Acid, Dil.	HCl
107	Hydrogen Sul. (Amber)	H_2S
152	Lead Acetate	$Pb(C_2H_3O_2)_2$
153	Mercuric Chloride	$HgCl_2$
103	Nitric Acid, Con.	HNO_3
104	Nitric Acid, Dil.	HNO_3
180	Polysulphide	Na_2X
171	Potassium Carbonate	K_2CO_3
160	Potassium Chromate	K_2CrO_4
182	Potassium Dichromate	$K_2Cr_2O_7$
172	Potassium Ferricyanide	$K_3Fe(CN)_6$
173	Potassium Ferrocyanide	$K_4Fe(CN)_6$
150	Potassium Hydroxide	KOH
145	Silver Nitrate (Amber)	$AgNO_3$
112	Sodium Carbonate	Na_2CO_3
111	Sodium Hydroxide	$NaOH$
129	Sodium Phosphate	Na_2HPO_4
156	Stannous Chloride	$SnCl_2$
175	Sulphuric Acid	H_2SO_4
101	Sulphuric Acid, Con	H_2SO_4
102	Sulphuric Acid, Dil	H_2SO_4
116	Blank	

Each, $ .60. Dozen **$6.00**

43M2. Capacity, 16 ounce (1 pint) (500 ml.) height, 7¾ inches.

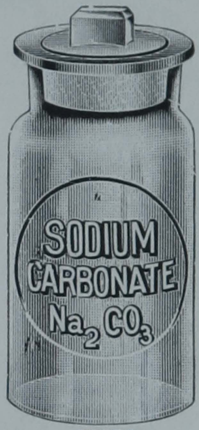
Number	Name	Symbol
237	Acetic Acid	$HC_2H_3O_2$
259	Alcohol	C_2H_5OH
241	Ammonium Acetate	CH_3COONH_4
235	Ammonium Carbonate	$(NH_4)_2CO_3$
234	Ammonium Chloride	NH_4Cl
204	Ammonium Hydroxide	NH_4OH
227	Am. Hydroxide, Dil	NH_4OH+Aq
258	Ammonium Oxalate	$(NH_4)_2C_2O_4$
236	Ammonium Sulph. (Amber)	$(NH_4)_2S$
229	Am. Sulphide, Dil.	$(NH_4)_2S+Aq$
262	Barium Acetate	$Ba(C_2H_3O_2)_2$
218	Barium Chloride	$BaCl_2$
261	Barium Nitrate	$Ba(NO_3)_2$
223	Calcium Hydroxide	$Ca(OH)_2$
225	Calcium Sulphate	$CaSO_4$
230	Ether	$(C_2H_5)_2O$
224	Ferrous Sulphate	$FeSO_4$
217	Hydrochloric Acid	HCl
222	Hydrochloric Acid, Con.	HCl
231	Hydrochloric Acid, Dil.	HCl
226	Hydrodisodic Phosphate	Na_2HPO_4
216	Nitric Acid	HNO_3
219	Nitric Acid, Con.	HNO_3
232	Nitric Acid, Dil.	HNO_3
238	Potassium Chromate	K_2CrO_4
239	Potassium Dichromate	$K_2Cr_2O_7$
221	Potassium Hydroxide	KOH
245	Silver Nitrate (Amber)	$AgNO_3$
240	Sodium Carbonate	Na_2CO_3
233	Sodium Hydroxide	$NaOH$
228	Sodium Hydroxide, Dil.	$NaOH+Aq$
215	Sulphuric Acid	H_2SO_4
220	Sulphuric Acid, Con	H_2SO_4
242	Sulphuric Acid, Dil	H_2SO_4
211	Blank	
260		$K_2Cr_2O_7+H_2SO_4$

Each, $ .80. Dozen **$7.90**

43M3. Capacity, 32 ounce (1 quart) (1 litre) height, 9½ inches.

Number	Name	Symbol
514	Acetic Acid	$HC_2H_3O_2$
513	Alcohol	C_2H_5OH
512	Ammonium Hydroxide	NH_4OH
505	Hydrochloric Acid, Con.	HCl
506	Hydrochloric Acid, Dil.	HCl
503	Nitric Acid, Con.	HNO_3
504	Nitric Acid, Dil.	HNO_3
501	Sulphuric Acid, Con.	H_2SO_4
502	Sulphuric Acid, Dil	H_2SO_4
511	Blank	

Each, $1.25. Dozen **$12.30**



43M4

Bottles, Wide Mouth Reagent:

The chemical names and equivalents are blown in the glass. The surface of the letters on each bottle is ground off to make it more legible. The glass stoppers are well ground to fit each individual bottle.

When ordering, the number of the bottle may be used instead of the name.

43M4. Capacity, 1 ounce(30 ml) height, 3⅛ inches.

Number	Name	Symbol
374	Ammonium Phosphate	$(NH_4)_2HPO_4$
361	Am. Sod. Phosphate	$NaNH_4HPO_4$
351	Borax	$Na_2B_4O_7$
364	Copper	Cu
365	Ferrous Sulphate	$FeSO_4$
366	Ferrous Sulphide	FeS
377	Phenyl Hydrazine	$C_6H_5NHNH_2$
367	Potassium Chlorate	$KClO_3$
358	Potassium Cyanide	KCN
368	Potassium Ferricyanide	$K_3Fe(CN)_6$
354	Potassium Nitrate	KNO_3
372	Test Paper	
353	Sodium Acetate	$NaC_2H_3O_2$
369	Sodium Bitartrate	$NaHC_4H_4O_6$
350	Sodium Carbonate	Na_2CO_3
370	Sodium Nitrate	$NaNO_3$
376	Sod. Pot. Carbonate	Na_2CO_3,K_2CO_3
371	Starch	
373	Zinc	
375	Blank	

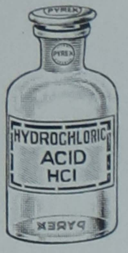
Each, $ .45. Dozen **$4.50**

43M5. Capacity, 4 ounce (¼ pint) (125 ml.), height, 4⅞ inches.

Number	Name	Symbol
314	Ammonium Sulphate	$(NH_4)_2SO_4$
304	Borax	$Na_2B_4O_7$
305	Ferrous Sulphate	$FeSO_4$
303	Potassium Cyanide	KCN
302	Potassium Nitrate	KNO_3
313	Sod. Am. Hyd. Phos	$Na(NH_4)HPO_4+4H_2O$
301	Sodium Carbonate	Na_2CO_3
312	Test Paper	
307	Blank	

Each, $ .55. Dozen **$5.20**

Bottles, Continued



44M1

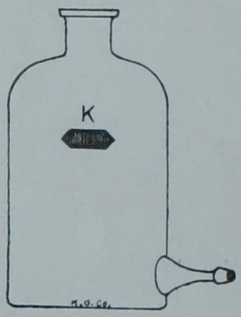
Bottles, Reagent, Labeled, Pyrex. Squat shape, with solid Pyrex ground-in, flat head stoppers. With dark, ruby letters on an opaque background. The lettering is an integral part of the bottle and is, therefore, indestructible.

Can be supplied labeled with any of the following reagents. Special labels can, however, be supplied at slightly advanced prices. Original packages contain bottles of one size only; but labels may be assorted.

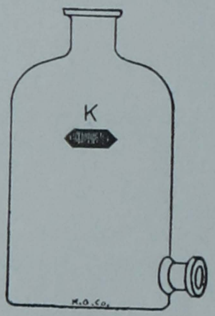
Acetic Acid
Acetone
Alcohol
Alcohol Absolute
Alcohol Denatured
Ammonium Carbonate
Ammonium Chloride
Ammonium Citrate
Ammonium Hydroxide
Ammonium Molybdate
Ammonium Oxalate
Ammonium Phosphate
Ammonium Sod. Phosphate
Ammonium Sulphide (Amber)
Barium Carbonate
Barium Chloride
Barium Hydroxide
Barium Nitrate
Benzene
Bromine Water
Calcium Chloride
Calcium Hydroxide
Calcium Hypochlorite
Calcium Sulphate
Carbon Disulphide
Carbon Tetrachloride
Chloroform
Citric Acid
Cupric Sulphate
Dimethyl Glyoxime
Ether
Fehlings Solution
Ferric Am. Sulphate
Ferric Chloride
Ferrous Sulphate
Hydrochloric Acid
Hydrochloric Acid, Con.
Hydrochloric Acid, Dil.
Hydrogen Sulphide (Amber)
Iodine Solution
Lead Acetate
Lime Water
Magnesia Mixture
Magnesium Sulphate
Mercuric Chloride
Mercurous Nitrate
Methyl Orange
Nitric Acid
Nitric Acid, Con.
Nitric Acid, Dil.
Oxalic Acid
Platinic Chloride
Potassium Carbonate
Potassium Chromate
Potassium Cyanide
Potassium Dichromate
Potassium Ferricyanide
Potassium Ferrocyanide
Potassium Hydroxide
Potassium Iodide
Potassium Permanganate
Potassium Sulphate
Potassium Thiocyanate
Silver Nitrate (Amber)
Sodium Acetate
Sodium Carbonate
Sodium Chloride
Sodium Hydroxide
Sodium Phosphate
Sodium Thiosulphate
Stannous Chloride
Starch Solution
Sulphuric Acid
Sulphuric Acid, Con.
Sulphuric Acid, Dil.

44M1 Bottles. Capacity 250 ml.; diameter, 65 mm.; height, 140 mm. **Each**.................................. **$ 1.50**
Case of 12 bottles.............................. **$16.20**

44M2 Bottles. Capacity, 500 ml.; diameter, 83 mm.; height, 172 mm. **Each**.................................. **$ 1.75**
Case of 12 bottles.............................. **$18.90**



44M3



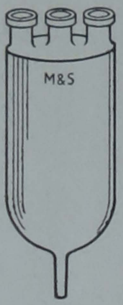
44M4

44M3 Bottles, Aspirator. Made of clear, heavy glass. With rubber tubing connection near bottom.

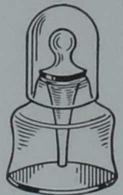
Capacity, ml...	125	250	500	1000	2000	4000	8000
Each	**$ .40**	**.40**	**.50**	**.75**	**1.00**	**1.50**	**6.50**

44M4 Bottles, Aspirator. With tubulature near bottom for cork or rubber stoppers.

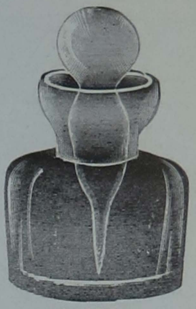
Capacity, ml.........	250	500	1000	2000	4000	8000
Each	**$ .40**	**.50**	**.75**	**1.00**	**1.50**	**6.50**



44M5



44M6

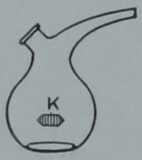


44M7

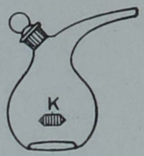
44M5 Bottles, De-aerating. With 3 necks and tubulature in bottom. Used by sugar factories for separating the air from the juice. **Each**............................ **$4.00**

44M6 Bottles, Balsam. With ground glass cap, with loose fitting stopper. Capacity, 1½ ounces. **Each**........... **$ .50**

44M7 Bottles, Dropping, Acid Test. With stopper or dropper ground in. Capacity, 1 ounce. **Each**....... **$ .40**



44M8



44M10

44M8 Bottles, Dropping, Schuster Type. With pourout and tubulature; without stopper.

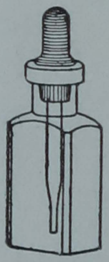
Capacity, ml..	30	60
Each..	**$ .50**	**.55**

44M9 Bottles, Dropping, Pyrex Glass, Schuster Type. With pourout and tubulature. Without stoppers. Capacity, 30 ml. **Each, $ .40. Case of 36**................. **$12.96**

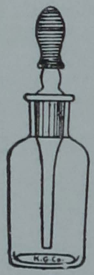
44M10 Bottles, Dropping, Schuster Type. With pourout and tubulature. With ground glass stoppers.

Capacity, ml............................	30	60
Each..	**$ .70**	**.80**

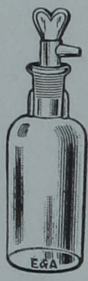
44M11 Bottles, Dropping, Pyrex Glass, Schuster Type. With ground-in glass stoppers. Capacity, 30 ml. **Each, $ .75. Case of 36**........................ **$24.30**



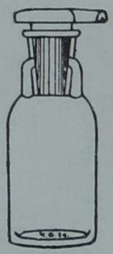
44M12



44M14



44M15



44M16

44M12 Bottles, Dropping, Barnes. With rubber bulb pipette stopper. Capacity, 30 ml. **Each**............... **$ .15**
Dozen... **$ 1.62**

44M13 Droppers Only. With rubber bulb stopper for 44M12 bottle. **Dozen**.................................. **$ .50**

44M14 Bottles, Dropping. With ground-in pipette stopper and rubber bulb.

Capacity, ml..........	15	30	60
Each..............................	**$ .34**	**.34**	**.36**

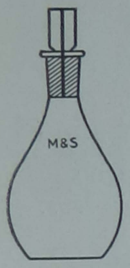
44M15 Bottles, Dropping. With crown shape grooved stopper.

Capacity, ml.......................	30	60
Each...................................	**$ .30**	**.40**

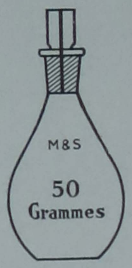
44M16 Bottles, Dropping, TK Type. With mushroom grooved stoppers.

Capacity, ml....	30	60	125	200
Each..........................	**$ .30**	**.40**	**.50**	**.60**

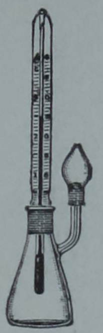
Bottles, Continued



45M1



45M2



45M3

45M1 Bottles, Specific Gravity, Unadjusted. With ground-in stoppers.

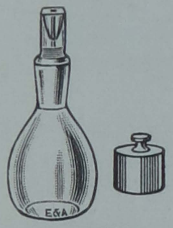
Capacity, ml.	5	10	25	50	100
Each	**$ .50**	**.50**	**.55**	**.65**	**.80**

45M2 Bottles, Specific Gravity, Adjusted. With ground-in stoppers.

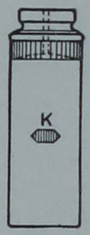
Capacity, ml.	5	10	25	50	100
Each	**$ .90**	**.90**	**1.00**	**1.25**	**1.50**

45M3 Bottles, Specific Gravity, Leach. With ground-in thermometer, 10° to 30° C. in 1/5° divisions. The 50 ml. size is used in **A. S. T. M. D-153.**

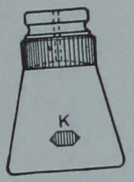
Capacity, ml.	10	25	50
Each	**$3.50**	**3.75**	**4.00**



45M4



45M5



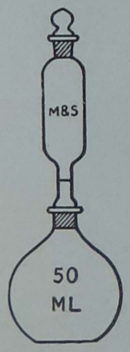
45M6

45M4 Bottles, Specific Gravity. Adjusted, with tare weight.

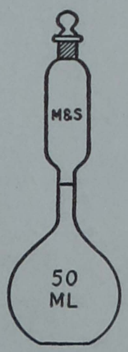
Capacity, ml.	25	50
Each, in paper box	**$2.50**	**3.00**

45M5 Bottles, Specific Gravity, Hubbard. For heavy bitumens. Used in **A. S. T. M. D-70.** Diameter, 22 mm. Height, 70 mm. With ground concave stopper, having hole approximately 1.6 mm. in diameter. Capacity, approximately 24 ml. **Each** **$1.25**

45M6 Bottles, Specific Gravity, Hubbard-Carmick. Designed to allow easier filling and cleaning and to have better stability. 45 mm. high, and 40 mm. wide at the bottom; capacity, approximately 25 ml. Stopper is concave on the under side and has a hole approximately 1.6 mm. in diameter. **Each** **$1.25**



45M7



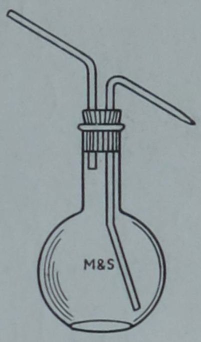
45M8

45M7 Bottles, Specific Gravity, Regnault. For Solids. With ground-in connections.

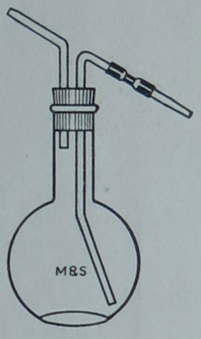
Capacity, ml.	25	50
Each	**$2.00**	**2.30**

45M8 Bottles, Specific Gravity, Regnault. For Liquids. With ground-in stoppers.

Capacity, ml.	25	50
Each	**$1.60**	**1.70**



45M9



45M11

45M9 Bottles, Washing. Ring neck glass flask with 2-hole rubber stopper and glass tubes.

Capacity, ml.	500	1000
Each	**$ .65**	**.90**

45M10 Bottles, Washing. Same as 45M9, except with **Pyrex** flask.

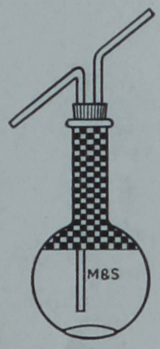
Capacity, ml.	500	1000
Each	**$ .75**	**1.00**

45M11 Bottles, Washing. Ring neck glass flask with 2-hole rubber stopper and glass tubes, exit tube with rubber tube joint.

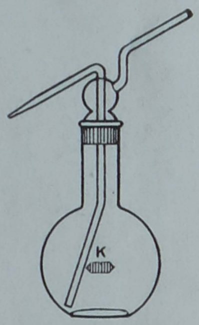
Capacity, ml.	500	1000
Each	**$ .65**	**.90**

45M12 Bottles, Washing. Same as 45M11, except with **Pyrex** flask.

Capacity, ml.	500	1000
Each	**$ .75**	**1.00**



45M13



45M15

45M13 Bottles, Washing, Pyrex, Wicker Covered Neck. Handwoven protectors snugly made to prevent slipping. Especially recommended for washing precipitates with hot solutions and for general use as laboratory wash bottles. With rubber stopper and glass tubes.

Capacity, ml.	500	1000
Each	**$1.25**	**1.50**

45M14 Bottles Only, Washing, Pyrex. With woven wicker-covered ring neck, without fittings.

Capacity, ml.	500	1000
Each	**$1.00**	**1.25**

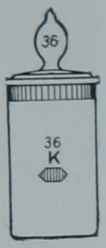
45M15 Bottles, Washing. For volatile liquids. With ground glass stopper, having mouthpiece and delivery tube sealed in.

Capacity, ml.	250	500	1000
Each	**$1.75**	**1.90**	**2.20**

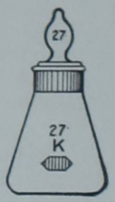
45M16 Bottles, Washing. Same as 45M15, except made of **Pyrex** glass.

Capacity, ml.	250	500	1000
Each	**$3.00**	**3.05**	**3.60**

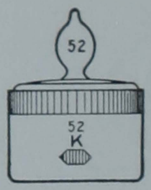
Bottles, Continued



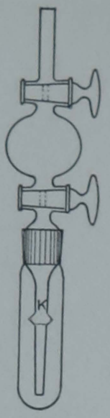
46M1



46M2



46M3



46M4

46M1 Bottles, Weighing. With cylindrical sides and flat bottom; ground glass stopper.

Height, mm	40	50	60	50	80
Diameter, mm	25	25	30	40	40
Each	**$ .35**	**.35**	**.40**	**.60**	**.60**

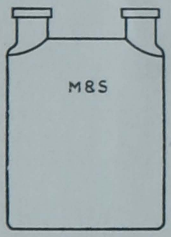
46M2 Bottles, Weighing. With conical sides and flat bottom; with ground glass stoppers.

Capacity, ml	15	30	60
Each	**$ .40**	**.45**	**.50**

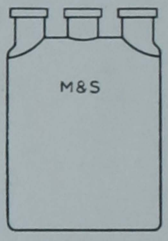
46M3 Bottles, Weighing. Low form with cylindrical sides and flat bottom; with ground glass stoppers.

Height, mm	30	30	30
Diameter, mm	50	60	70
Each	**$ .80**	**.90**	**1.00**

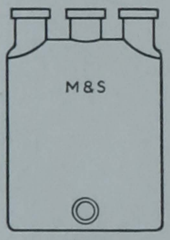
46M4 Bottles, Weighing, Lunge. For weighing corrosive liquids. The pipette has a bulb between two stopcocks, and the enlargement on the delivery stem is ground into the protection tube. The capacity is approximately 15 ml.
Each **$3.80**



46M5



46M6



46M7

46M5 Bottles, Woulff's. Heavy glass, with **two necks.**

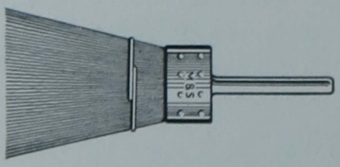
Capacity, ml	250	500	1000	2000	4000
Each	**$1.50**	**1.60**	**2.00**	**3.00**	**4.00**

46M6 Bottles, Woulff's. Heavy glass, with **three necks.**

Capacity, ml	250	500	1000	2000	4000
Each	**$1.65**	**1.75**	**2.50**	**3.50**	**4.50**

46M7 Bottles, Woulff's. Heavy glass, with **three necks,** and with **tubulature on side** at bottom, for cork or rubber stoppers.

Capacity, ml	500	1000	2000	4000
Each	**$2.25**	**3.50**	**4.50**	**9.00**

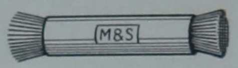


46M8

46M8 Brooms, Whisk. For amalgam plates, of bassine fibre in metal band, reinforced with heavy wire binding. 11 inches overall length. **Each** .... **$ .40**

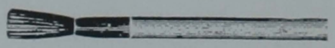
46M9 Brooms, Whisk. Of broom corn fibre. Body, 7 1/2 inches, length overall, 10 1/2 inches, with metal ring in handle.
Each .... **$ .35**

Brushes



46M10

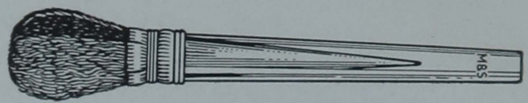
46M10 Brushes, Button. For cleaning assay buttons. The bristles are firmly set in both ends of brass tubing, 5/8 inches diameter by 2 1/2 inches long. Total length, 3 3/4 inches.
Each .... **$ .90**



46M11

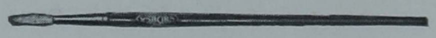
46M11 Brushes, Camel Hair, Quill. Pencil brushes.

Size	Small	Medium	Large
Dozen	**$ .25**	**.35**	**.45**



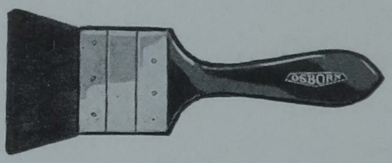
46M12

46M12 Brushes, Camel Hair, Quill. Large, 1/2 inch diameter by 4 inches long.
Each .... **$ .40**



46M13

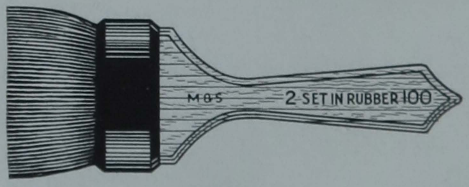
46M13 Brushes, Cleaning. For cleaning crucibles and parting cups. 1/4 inch diameter. Brush part 1 1/8 inches long. 12 inches over all length. **Each** .... **$ .20**



46M14

46M14 Brushes, Camel Hair. Flat, tin ferrule, wood handle.

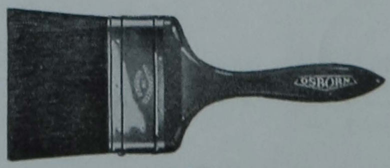
Width, Inches	1/2	1	1 1/2	2
Length hair, inches	15/16	1 1/16	1 1/8	1 3/16
Each	**$ .25**	**.30**	**.35**	**.40**



46M15

46M15 Brushes, Camel Hair. Flat, rubber bound, vulcanized in rubber, on wood handle. For cleaning balances and pans.

Width, Inches	1	1 1/2	2	2 1/2	3
Length hair, inches	1 1/8	1 1/4	1 1/4	1 1/2	1 1/2
Each	**$ .70**	**.90**	**1.10**	**1.25**	**1.80**

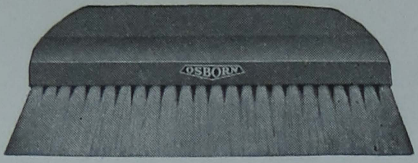


46M16

46M16 Brushes, Cleaning. Of bristle, flat, nickeled ferrule. Vulcanized in hard rubber.

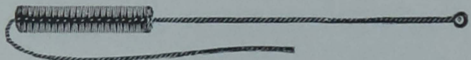
Width, inches	1	2	3	3 1/2	4
Each	**$ .20**	**.30**	**.50**	**.60**	**.85**

Brushes, Continued



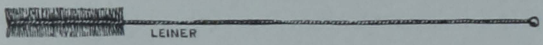
47M1

47M1 Brushes, Cleaning. Of black horse hair. Staple set in wood block. For cleaning buckboards, etc. Length, 10 inches. Length of hair, 2 inches.
Each.. $ .75



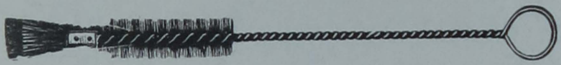
47M2

47M2 Brushes, Narrow Tube. White bristles, brush part 3½ inches long, ½ inch diameter in center of twisted, galvanized wire. Total length, 23 inches. **Each**......... $ .08
Dozen.. $ .96



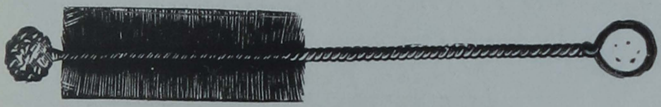
47M3

47M3 Brushes, Narrow Tube. With white bristles, brush part 3 inches long, ½ inch diameter. Total length, 13 inches.
Each, $ .06. Dozen........................ $ .70



47M4

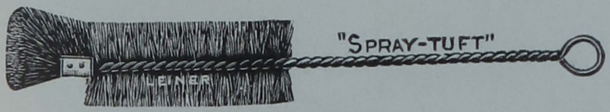
47M4 Brushes, Small Test Tube. Black bristles, brush part 2¾ inches. Diameter, ½ inch. Total length, 9 inches. Tinned wire handle. **Each, $ .05. Dozen**........... $ .60



47M5

47M5 Brushes, Test Tube. With sponge tip, white bristles. Brush part 2½ inches. Diameter, ¾ inch. Total length, 9 inches. Tinned wire handle. Suitable for cleaning ½ and ⅝ inch diameter test tubes. **Each, $ .06. Dozen**....... $ .70

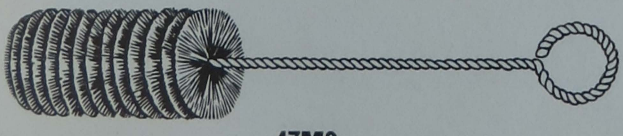
47M6 Brushes, Test Tube. Same as 47M5, except bristle length, 3 inches. Diameter, 1⅜ inches. Total length, 10 inches. Suitable for ¾-inch and larger test tubes. **Each** $ .06
Dozen.. $ .75



47M7

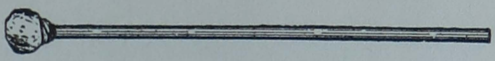
47M7 Brushes, Test Tube, Small. Spray-tuft brush for cleaning test tubes and bottles. Thoroughly cleans every part of a test tube. Black bristles. Brush part 2½ inches. Diameter, ¾ inch. Total length, 9 inches. **Each**........... $ .06
Dozen.. $ .70

47M8 Brushes, Test Tube, Large. Same as 47M7, except diameter of bristles, 1½ inches. **Each, $ .06. Dozen** $ .75



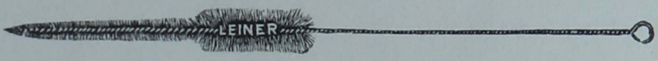
47M9

47M9 Brushes, Wasserman Test Tube. Brush part ⅝ inch diameter by 3 inches, length. With double radial tip 1 inch diameter. Length overall, 8 inches. **Each**...... $ .05
Dozen.. $ .60



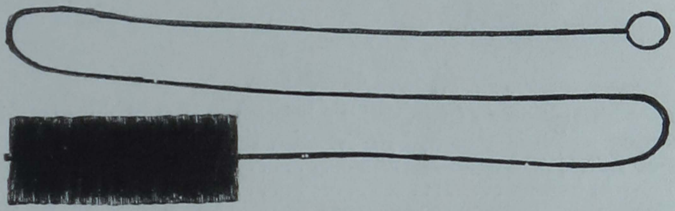
47M10

47M10 Brushes, Probang. Sponge attached to ¼ inch, rounded flexible rattan handle. Total length, 9 inches.
Each $ .15 Dozen........................... $1.50



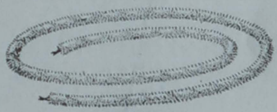
47M11

47M11 Brushes, Pipette. Brush part 7½ inches long, tapering from ¾ inch to ⅛ inch in diameter. Total length, 16 inches. **Each, $ .12. Dozen**...................... $1.30



47M12

47M12 Brushes, Burette. Black bristles. Brush part length, 4 inches, diameter, 1¼ inches. Total length, 36 inches. Twisted, tinned wire handle. **Each**.................. $ .15



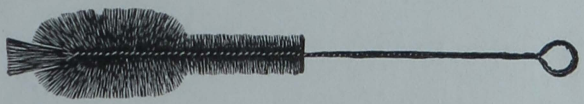
47M13

47M13 Brushes, Tube Cleaners. Similar to the ordinary pipe cleaner. Bound on wire and ideally suited for cleaning small pipettes, stopcocks, stopcock plugs, capillary tubing, etc. Suitable for cleaning tubes 1.5 mm. to 3 mm. in diameter; or can be used for slightly larger tubes by bending the cleaner in a zigzag manner.

Lengths, feet	10	50
Each	$ .25	.85

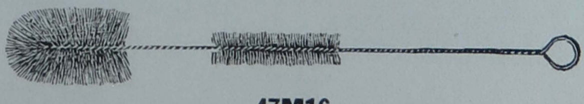
47M14 Brushes, Tube Cleaners. Similar to 47M13, except heavier and more bushy. Used for cleaning tubes 2.5 mm. to 5 mm. in diameter.

Lengths, feet	10	50
Each	$ .50	1.65



47M15

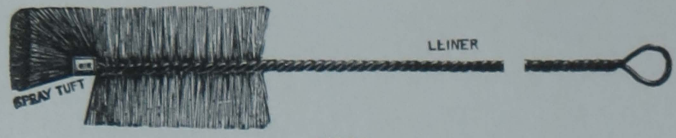
47M15 Brushes, Milk Test Bottle. White bristles. Diameter of brush, 2x½ inches. Length, 4 inches. Total length, 11 inches. Twisted tinned wire handle. **Each**........ $ .10
Dozen.. $1.00



47M16

47M16 Brushes, Milk Test Bottle. White bristles. Brush part, diameter, 1¾ inches by ½ inch. Length, brush part, 1½x2½ inches. Total length, 11 inches. On twisted, tinned wire handle. **Each, $ .15. Dozen**.................. $1.50

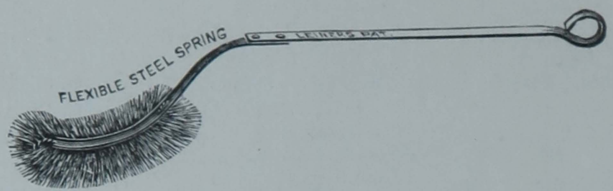
Brushes, Continued



48M1

48M1 Brushes, Cylinder. With spray-tuft end. Made of black bristles. Twisted brass wire handle.

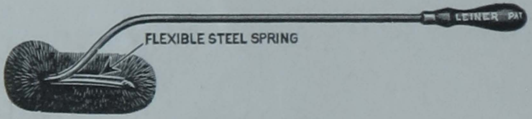
Length, inches	**10½**	**12**	**15**	**20**
Length, brush, inches	3½	4	5	5½
Diameter, brush, inches	2	2⅛	2¼	2⅜
Each	**$ .10**	**.12**	**.18**	**.20**



48M2

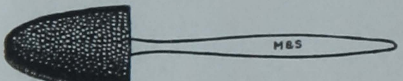
48M2 Brushes, Flask. White bristles mounted on a steel spring which is attached to the stiff, tinned metal handle.

For flasks of capacity, ml.	**250**	**500**	**1000**
Length, inches	14	16	18
Each	**$ .24**	**.30**	**.35**



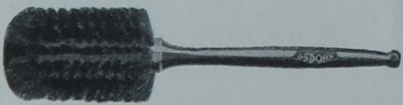
48M3

48M3 Brushes, Flask and Bottle. White bristles mounted on a flexible spring attached to a stiff metal handle. Brush part 1 inch diameter. Total length, 16 inches. **Each** . . **$ .30**



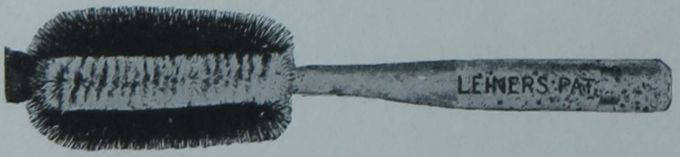
48M4

48M4 Brushes, Beaker. Black china bristles 2½ inches diameter. Brush part 3½ inches long. Spiral wound on wood handle. 13 inches long over all. **Each** . . . . **$ .40**



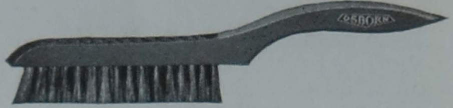
48M5

48M5 Brushes, Beaker. Also used for cleaning tumblers and large cylinders. Made of stiff bristles 2¾ inches diameter. Brush part 4½ inches long. Knot-type. Each tuft of bristle is securely held in an individual hole and the loss of one tuft will not affect any others. Length over all, 13 inches. Staple set, hickory handle. **Each** **$1.25**


LEINERS PAT.

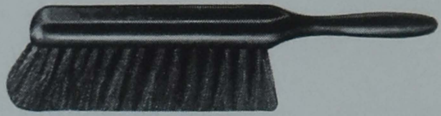
48M6

48M6 Brushes, Beaker. Also used for cleaning tumblers, funnels, graduates, jars, cylinders, etc. Black bristles. Length, 5 inches by 3 inches diameter. Total length, 12 inches. Made of 4 twisted wire brushes mounted together with end tuft on a wood handle. **Each** . . . . **$ .50**



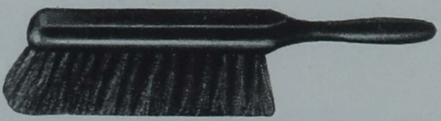
48M7

48M7 Brushes, Cement Mold. For cleaning metal molds, etc. Fine brass wires with wood handle. Brush part, length, 5½ inches; length, over all, 11½ inches, trim 1 inch. **Each** . . . . **$ .90**



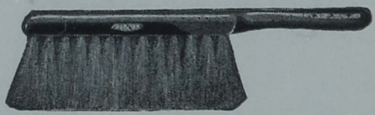
48M8

48M8 Brushes, Counter or Bench Dusters. Made of a heavy grade of black China bristle, cement set in a solid lacquered handle. Length of bristle, 2⅞ inches. Length of brush part, 8 inches. **Each** **$2.20**



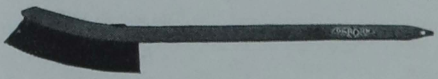
48M9

48M9 Brushes, Counter or Bench Dusters. Made with a combination of mixed black horse hair, fine wire, and black Tampico. The wires keep the brush in shape and add materially to its life and wearing qualities. Length bristle, 2¾ inches. Length of brush part, 8 inches. Staple set, lacquered handle. **Each** **$1.25**



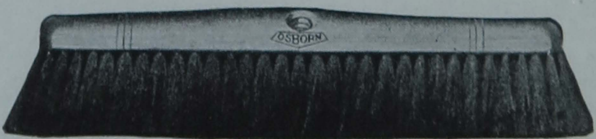
48M10

48M10 Brushes, Counter or Bench Dusters. Made of extra stiff pure black hair. Staple set; varnished handles. Length of bristle, 2½ inches. Length of brush part, 8 inches. **Each** **$1.15**



48M11

48M11 Brushes, Sampler. For cleaning ore samplers. Brush part, 7 inches long. Black horse hair, 1¾ inches long. Wood handle, ⅜ inch wide. Length over all, 24 inches. **Each** . **$ .50**



48M12

48M12 Brushes, Floor. Made of pure black horse hair. Solid block; 2-threaded handle holes. Staple set. Oval face; polished handle. Length of hair, 2⅝ inches. Length, 16 inches. **Each** **$2.40**

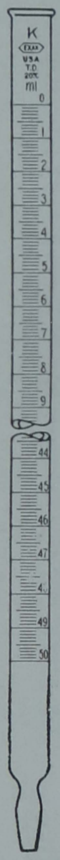
Burettes

In addition to our standard grade, the following are also shown:

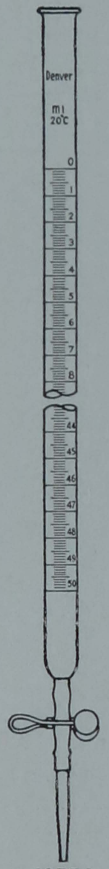
Exax Blue Line Grade: All lines and numerals are of durable blue glass fused in. This grade is well known for its analytical accuracy, uniform design and calibrations. Each burette comes within the following tolerances: 10 ml......±0.04 ml., 25 ml....±0.06 ml., 50 ml...±0.10 ml., 100 ml...±0.20 ml.

Normax Grade: With white line graduations and numerals. Each Burette is graduated within the tolerances specified by the U. S. Bureau of Standards. These can be furnished with U. S. Bureau of Standards' certificates where so listed.

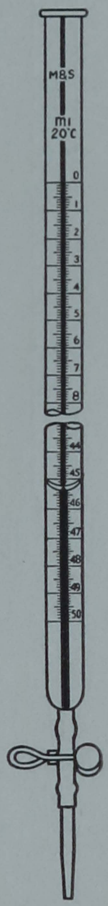
Schellbach Burettes: Standard quality with blue enameled stripe on white enameled background.



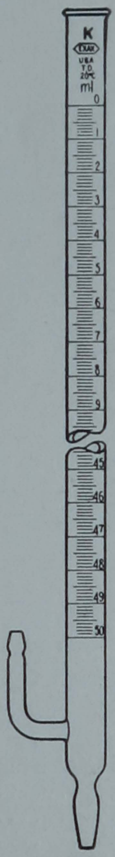
49M1



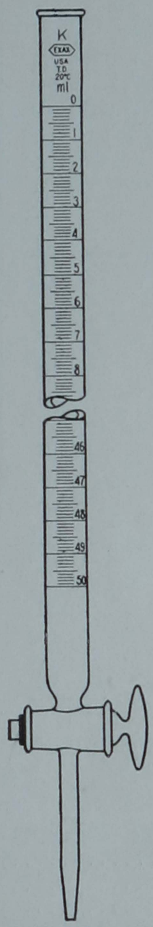
49M4



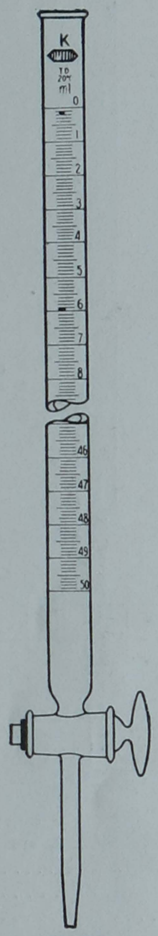
49M5



49M6



49M7



49M8

49M1 Burettes, Exax Blue Line, for Pinchcock. Without attachments.

Capacity, ml.	**25**	**50**	**100**
Graduated, ml.	1/10	1/10	1/5
Quantity in case	12	24	6
Each	**$ .70**	**.80**	**1.20**
Case	**$ 6.72**	**15.36**	**5.76**

49M2 Burettes, Exax Blue Line, for Pinchcock. Same as 49M1, except complete with rubber tube, delivery tip and pinchcock.

Capacity, ml.	**25**	**50**	**100**
Graduated, ml.	1/10	1/10	1/5
Quantity in case	12	24	6
Each	**$ .90**	**1.00**	**1.40**
Case	**$ 9.72**	**21.60**	**7.56**

49M3 Burettes, for Pinchcock. Without attachments.

Capacity, ml.	**25**	**50**	**100**
Graduated, ml.	1/10	1/10	1/5
Quantity in case	36	48	36
Each	**$ .50**	**.60**	**.90**
Case	**$16.20**	**25.92**	**29.16**

49M4 Burettes, for Pinchcock. Complete with rubber tube, delivery tip and pinchcock.

Capacity, ml.	**25**	**50**	**100**
Graduated, ml.	1/10	1/10	1/5
Quantity in case	36	48	36
Each	**$ .70**	**.80**	**1.10**
Case	**$22.68**	**34.56**	**35.64**

49M5 Burettes, Schellbach, for Pinchcock. Blue Enameled stripe on white enameled back. Complete with rubber tube, delivery tip and pinchcock.

Capacity, ml.	**25**	**50**	**100**
Graduated, ml.	1/10	1/10	1/5
Each	**$ 1.80**	**2.20**	**3.00**
Dozen	**$19.44**	**23.76**	**32.40**

49M6 Burettes, Exax Blue Line, for Pinchcock. With side tube for refilling. Without attachments.

Capacity, ml.	**25**	**50**	**100**
Graduated, ml.	1/10	1/10	1/5
Quantity in case	12	24	6
Each	**$ 1.00**	**1.10**	**1.50**
Case	**$ 9.60**	**21.12**	**7.20**

49M7 Burettes, Exax Blue Line, Straight Glass Stopcock.

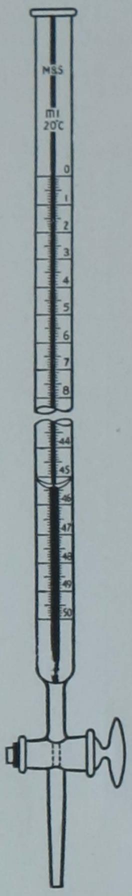
Capacity, ml.	**10***	**25**	**50**	**100**
Graduated, ml.	1/20	1/10	1/10	1/5
Quantity in case	12	18	24	6
Each	**$ 1.50**	**1.65**	**1.70**	**2.20**
Case	**$14.40**	**23.76**	**32.64**	**10.56**

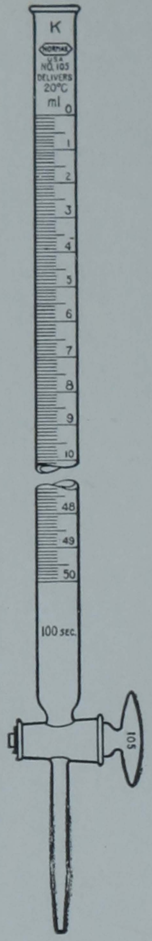
*Suitable for micro analysis.

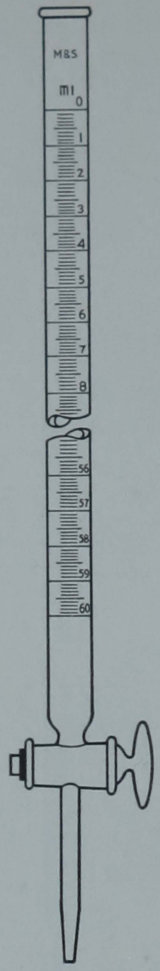
49M8 Burettes, Straight Glass Stopcock.

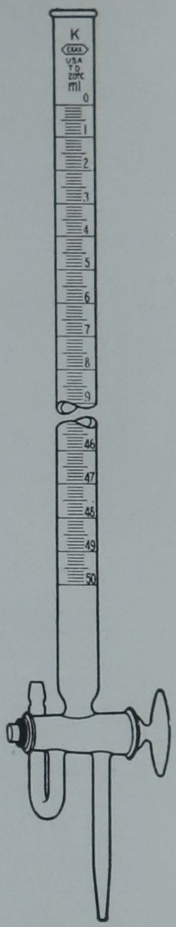
Capacity, ml.	**25**	**50**	**100**
Graduated, ml.	1/10	1/10	1/5
Quantity in case	36	48	24
Each	**$ 1.10**	**1.20**	**1.70**
Case	**$35.64**	**51.84**	**36.72**

Burettes, Continued


50M1


50M2


50M4


50M5

50M1 Burettes, Schellbach, Straight Glass Stopcock. Blue enameled stripe on white enameled back.

Capacity, ml.	**25**	**50**	**100**
Graduated, ml.	1/10	1/10	1/5
Each	**$ 1.85**	**2.60**	**3.25**
Dozen	**$19.98**	**28.08**	**35.10**

50M2 Burettes, Normax, Precision. With straight glass stopcock. All retested and will be found accurate within the tolerance specified by National Bureau of Standards in Circular No. 9, "Testing of Glass Volumetric Apparatus."

Capacity, ml.	**10**	**25**	**50**	**100**
Graduated, ml.	1/20	1/10	1/10	1/5
Tolerance, ml., plus or minus	.02	.03	.05	.10
Quantity in case	6	6	6	3
Each	**$ 3.00**	**3.25**	**3.50**	**4.00**
Case	**$14.40**	**15.60**	**16.80**	**9.60**

50M3 Burettes, Normax, Precision, Bureau of Standards. Same as 50M2, except supplied with certificate of approval by the National Bureau of Standards.

Capacity, ml.	**10**	**25**	**50**	**100**
Graduated, ml.	1/20	1/10	1/10	1/5
Each	**$ 6.75**	**7.00**	**7.25**	**7.75**

50M4 Burettes, Special, Straight Glass Stopcock. White line graduation. Special capacities, furnished on special order only.

Capacity, ml.	**60**	**75**
Graduated, ml.	1/10	1/10
Each	**$ 2.25**	**2.50**

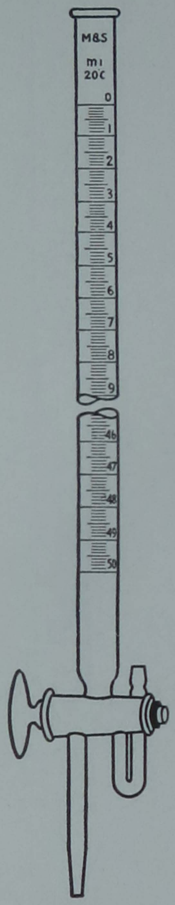
50M5 Burettes, Exax Blue Line, Three-way Stopcock.

Capacity, ml.	**25**	**50**	**100**
Graduated, ml.	1/10	1/10	1/5
Quantity in case	6	12	6
Each	**$ 2.30**	**2.50**	**3.00**
Case	**$11.04**	**24.00**	**14.40**

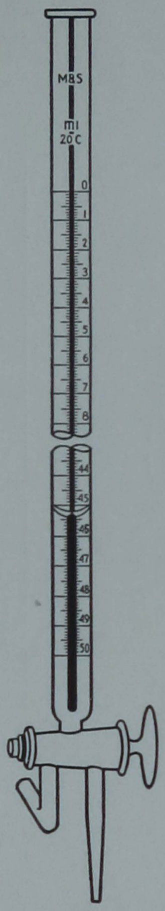
50M6 Burettes, Special, Exax Blue Line, Three-way Stopcock. Same as 50M5, except refilling tube is bent back from the stopcock rather than up.

Capacity, ml.	**25**	**50**	**100**
Graduated, ml.	1/10	1/10	1/5
Each	**$ 2.55**	**2.75**	**3.25**

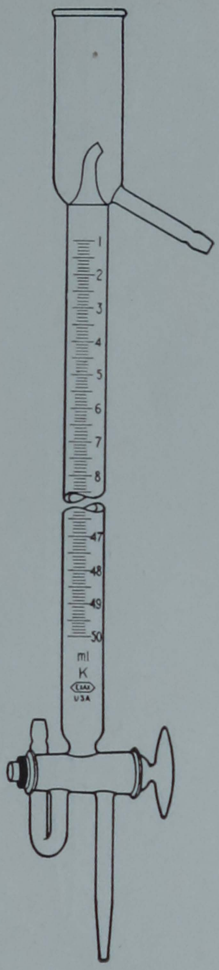
Burettes, Continued



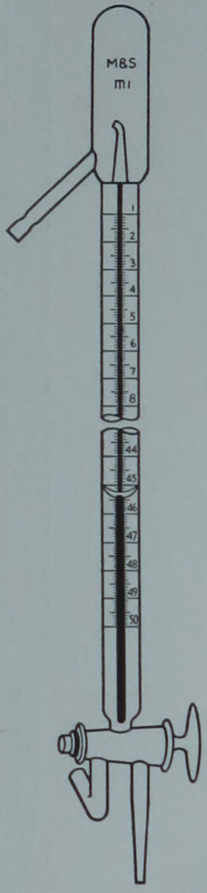
51M1



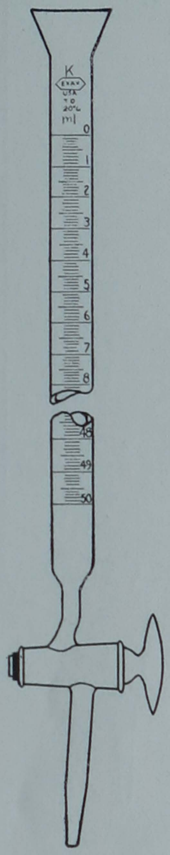
51M2



51M3



51M4



51M5

51M1 Burettes, Special. With three-way stopcock and white line graduations. Stopcock is on the left hand side so that operator can use right hand for stirring. Especially made for lead and zinc work. Graduated ⅒ ml.

Capacity, ml.	50	60
Each	**$3.00**	**3.00**

51M2 Burettes, Schellbach, Three-way Stopcock. Blue enameled stripe on white enameled back.

Capacity, ml.	**25**	**50**	**100**
Graduated, ml.	⅒	⅒	⅕
Each	**$ 3.25**	**3.75**	**4.75**
Dozen	**$35.10**	**40.50**	**51.30**

51M3 Burettes, Exax Blue Line, Automatic. With three-way stopcock, overflow cup and zero adjusting orifice.

Capacity, ml.	**25**	**50**	**100**
Graduated, ml.	⅒	⅒	⅕
Quantity in case	3	6	3
Each	**$4.00**	**4.50**	**5.50**
Case	**$9.60**	**21.60**	**13.20**

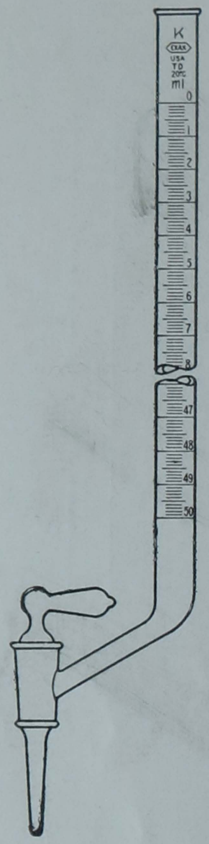
51M4 Burettes, Schellbach, Automatic. Blue enameled stripe on white enameled back. With three-way stopcock, overflow cup and zero adjusting orifice.

Capacity, ml.	**25**	**50**	**100**
Graduated, ml.	⅒	⅒	⅕
Each	**$ 4.00**	**5.25**	**6.50**
Dozen	**$43.20**	**56.70**	**70.20**

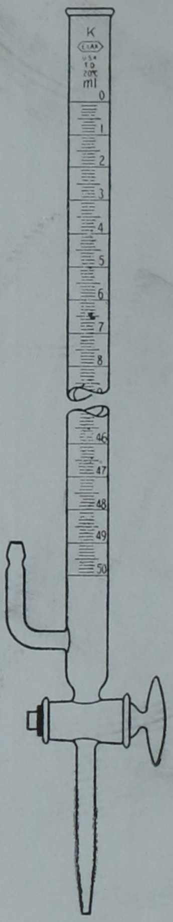
51M5 Burettes, Exax Blue Line, Funnel Top. Stopcock with diagonal bore.

Capacity, ml.	**25**	**50**	**100**
Graduated, ml.	⅒	⅒	⅕
Quantity in case	18	24	6
Each	**$ 2.00**	**2.40**	**2.60**
Case	**$28.80**	**46.08**	**12.48**

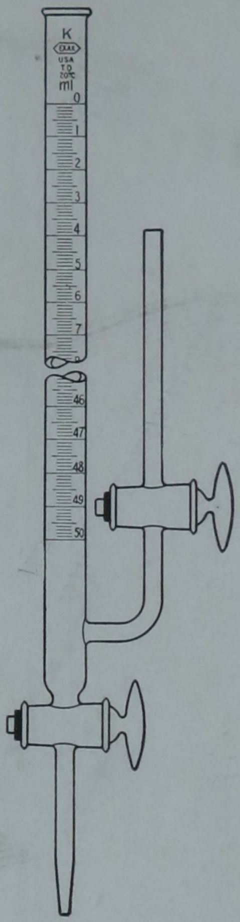
Burettes, Continued



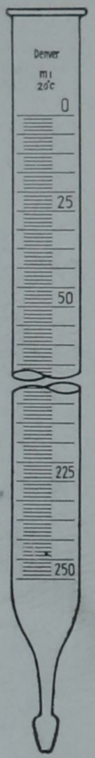
52M1



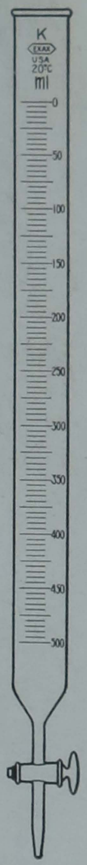
52M2



52M3



52M4



52M5

52M1 Burettes, Exax Blue Line, Fresenius Type. With stopcock set at angle.

Capacity, ml.	**25**	**50**	**100**
Graduated, ml.	⅒	⅒	⅕
Quantity in case	18	24	6
Each	**$ 2.30**	**2.50**	**3.00**
Case	**$33.12**	**48.00**	**14.40**

52M2 Burettes, Exax Blue Line. With straight glass stopcock and side tube for refilling.

Capacity, ml.	**25**	**50**	**100**
Graduated, ml.	⅒	⅒	⅕
Quantity in case	12	12	6
Each	**$ 2.00**	**2.10**	**2.60**
Case	**$19.20**	**20.16**	**12.48**

52M3 Burettes, Exax Blue Line. With stopcocks on both delivery tube and refilling side tube.

Capacity, ml.	**50**	**100**
Graduated, ml.	⅒	⅕
Quantity in case	6	6
Each	**$ 3.00**	**4.00**
Case	**$14.40**	**19.20**

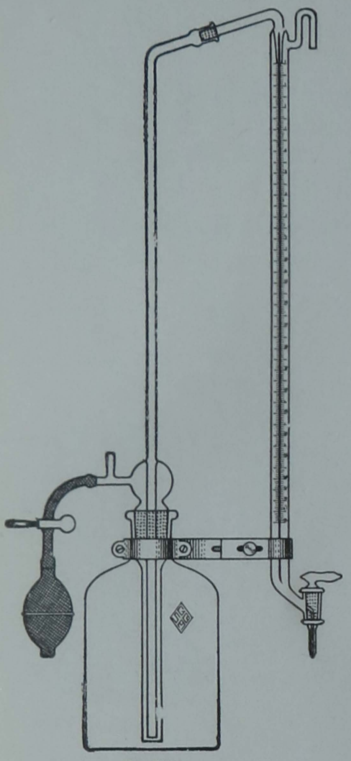
52M4 Burettes, Exax Blue Line, Dispensing. For pinchcock. Without attachments.

Capacity, ml.	**250**	**500**	**1000**
Graduated, ml.	1	5	10
Quantity in case	6	6	3
Each	**$ 2.25**	**2.50**	**3.00**
Case	**$10.80**	**12.00**	**7.20**

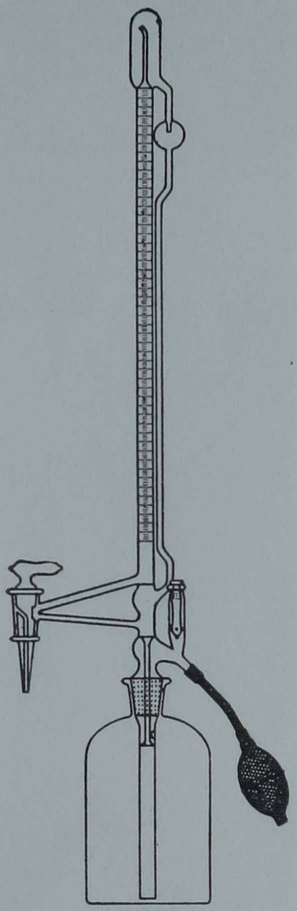
52M5 Burettes, Exax Blue Line, Dispensing. With straight glass stopcock.

Capacity, ml.	**250**	**500**	**1000**
Graduated, ml.	1	5	10
Quantity in case	6	6	3
Each	**$ 3.00**	**3.50**	**4.50**
Case	**$14.40**	**16.80**	**10.80**

Burettes, Continued



53M1



53M3

53M1 Burette Titration Apparatus, Ground Joint. Squibb's Automatic Improved Form. Filled by pressure. Complete with burette, blue line on white enameled back, with stopcock, bottle, clamp, ground joint connecting tube and rubber bulb.

Capacity of burette, ml.	**25**	**50**
Graduated, ml.	1/10	1/10
Capacity of bottle, ml.	1000	2000
Outfit complete	**$11.70**	**12.90**

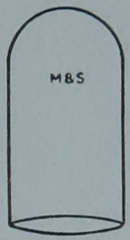
53M2 Burette Titration Apparatus, Slip Joint. Same as 53M1, except supplied with Schellbach burette and slip joint, rubber tube connections. Bottle supplied with 2-hole rubber stopper.

Capacity of burette, ml.	**25**	**50**
Graduated, ml.	1/10	1/10
Capacity of bottle, ml.	1000	2000
Outfit complete	**$ 7.00**	**8.00**

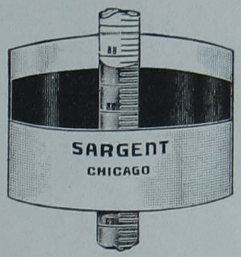
53M3 Burettes, All automatic. Made of Pyrex glass, with full length interchangeable ground glass joint and stopcock. The zero mark sets in automatically, and remaining solution can be returned by an adjustment of the plunger. Burette is made with the utmost precision; the superior workmanship, plus a rigid inspection, insures the quality of the results obtained. The calibrated column is made following Bureau of Standards specifications.

Outfit complete with bottle, burette and rubber bulb.

Capacity, burette, ml.	**10**	**25**	**50**
Graduations, ml.	1/20	1/10	1/10
Capacity of bottle, ml.	1000	1000	2000
Outfit complete	**$10.20**	**10.80**	**12.00**



53M4

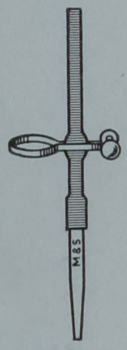


53M5

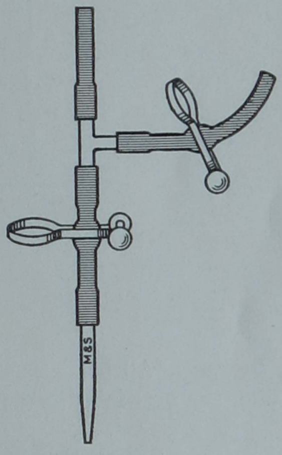
53M4 Burette Caps. Glass. To protect the inside of burettes from dust.

For burette capacity, ml.	25	50	100
Dozen	**$ .72**	**.72**	**.72**

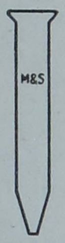
53M5 Burette Meniscus Readers. Instantly attached or removed. Sharp definition of Meniscus obtained by contrasting reflection of black and white background. Made of celluloid.
Each .... **$ .25**



53M6



53M7

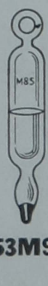


53M8

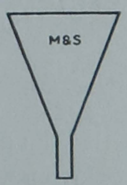
53M6 Burette Attachments, Pinchcock. For attaching to burettes without stopcocks. Consists of a burette tip with rubber tubing connection and pinchcock.
Each .... **$ .20**

53M7 Burette Attachments, Three-way. For attaching to refilling burettes without stopcocks. Consists of a burette tip, glass T-tube, three rubber connections and two pinchcocks.
Each .... **$ .50**

53M8 Burette Tips. For use with pinchcock burettes. Outside diameter, 6 mm.; inside diameter, 2 mm.; bore at tip, ½ mm.; length, 65 mm. **Each** .... **$ .05**



53M9



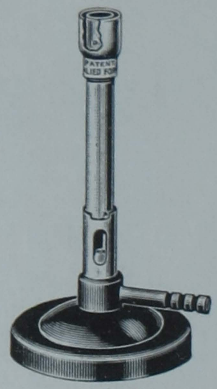
53M10

53M9 Burette Floats. With points to prevent clinging to side of burette.

For burette capacity, ml.	25	50	100
Each	**$ .70**	**.80**	**.90**

53M10 Burette Funnels. Glass. For filling burettes. Diameter, 35 mm.; length, 60 mm. **Each** .... **$ .10**

Burners



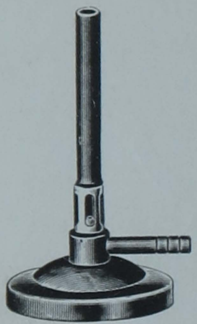
54M1

P. G. E. Tops. For burning straight or mixed gases apt to "pull" away from the burner mouth on ordinary burners, the P. G. E. Top, illustrated at the left, serves as a pilot ring, fed by a portion of the gas at low velocity so that the flame remains stable, firm and vigorous.

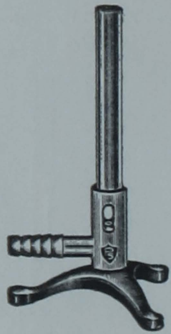
All burners can be disassembled readily for removing stray particles accidentally dropped into the tubes. Threads are machine true; parts will not freeze together; yet joints are leak-proof, with free unobstructed gas passages.

54M1 Burners, Bunsen, P. G. E. Top. All parts are brass, except the base, which is heavy stamped steel with baked-on corrosion-resisting black japan. The burner has a ½-inch tube, **for all mixed or straight natural gases between 800 and 1200 B. t. u's.** Height, 6 inches. **Each** .... **$ .75**

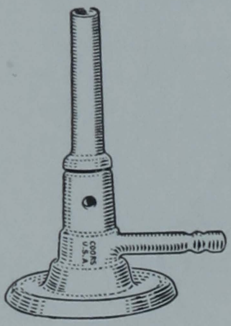
54M2 Burners, Bunsen, P. G. E. Top. Same as 54M1, except **for cylinder gases from 2400 to 3200 B. t. u's. Each** .... **$ .70**



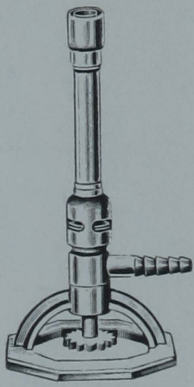
54M3



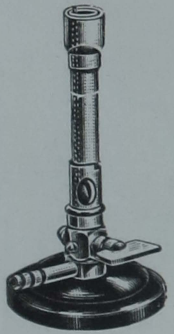
54M6



54M7



54M8



54M10

54M3 Burners, Bunsen. All brass except base, which is heavy stamped steel coated with baked-on corrosion-resisting black japan. 7/16-inch tube, **for artificial gases up to 600 B. t. u's.** Height, 6 inches. **Each** .... **$ .35**

54M4 Burners, Bunsen. Same as 54M3, except with ½-inch tube, **for all mixed natural gases between 600 and 800 B. t. u's.** Height, 6 inches. **Each** .... **$ .50**

54M5 Burners, Bunsen. Same as 54M3, except **for cylinder gases 2000 to 2400 B. t. u's.** Height, 6 inches. **Each** ... **$ .45**

54M6 Burners, Bunsen, "Student." Rugged, fool-proof, easy to handle. Has fixed orifice, brass mixing tube, 7/16 inches in diameter, and cast iron base. Suitable **for artificial gases up to 600 B. t. u's. Each** .... **$ .25**

54M7 Burners, Bunsen, Coors Porcelain. For artificial gases. Height, 6 inches. **Each** **$3.25**

54M8 Burners, Tirrill Type, P. G. E. Top. With gas and air control. Rugged and substantial in construction. Ideal for industrial and educational laboratories where efficiency and economy are of paramount importance. Noiseless flame may be maintained in any draft and will burn safely at practically any angle without flash back. All brass, including base. Mixing tube, ½-inch outside diameter. Height, 6½ inches. **Suitable for all gases up to 3200 B. t. u's. Each** **$1.50**

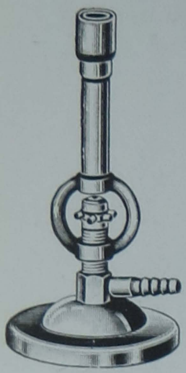
54M9 Burners, Tirrill Type. Same as 54M8, except with **plain top** and japanned iron base. **For all gases including straight and mixed natural up to 800 B. t. u's. Each** .... **$ .90**

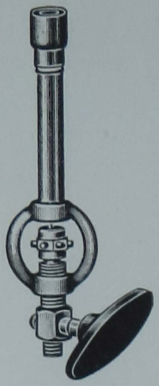
54M10 Burners, Bunsen, Pilot, P. G. E. Top. The pilot, as well as the master flame, can be controlled independently by an adjusting screw. One-half turn of the stopcock shuts off the gas supply, while a one-fourth turn extinguishes the master flame only, leaving the pilot flame burning. The stopcocks are brass with tight, ground-in, leak-proof bronze plugs. Fixed, non-removable orifices, sleeve type regulators. All parts brass, except base, which is stamped steel with Duco finish. Mixing tube ½-inch outside diameter; base, 3 inches in diameter; height, 6 inches. **Suitable for all gases, including straight and mixed natural, between 800 and 1200 B. t. u's. Each** **$2.25**

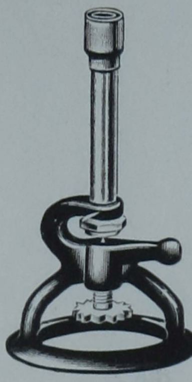
54M11 Burners, Bunsen, Pilot. Same as 54M10, except with **plain top. For artificial gases up to 600 B. t. u's. Each** . **$1.80**

54M12 Burners, Bunsen, Pilot. Same as 54M11, except **for all gases including straight or mixed natural up to 800 B. t. u's. Each** **$1.80**

Burners, Continued


55M1


55M4


55M6

55M1 Burners, Fletcher, P. G. E. Top. Orifice is adjustable and is controlled by a screw cap through which the needle valve protrudes. Very close control of the gas flow is obtainable; and by turning the yoke which supports the mixing tube, primary air supply is regulated. All parts, including the base, are brass. Mixing tube, ½ inch outside diameter. Height, 6¾ inches. **For all gases,** including straight and mixed natural, from **800 to 1500 B. t. u's. Each**...........**$1.35**

55M2 Burners, Fletcher. Same as 55M1, except with **plain top. For all gases,** including straight and mixed natural, **up to 800 B. t. u's. Each**.......................**$1.00**

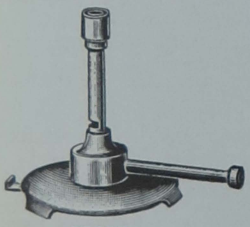
55M3 Burners, Fletcher, P. G. E. Top. Same as 55M1, except equipped with fixed orifice **for cylinder gases** from **2200 to 3200 B. t. u's. Each**.....................**$1.50**

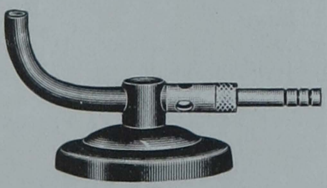
55M4 Burners, Fletcher, P. G. E. Top. Same as 55M1, except without base. Furnished with stop cock for ⅛ inch I. P. S. thread for pipe mounting. **For all gases,** including straight and mixed natural, from **800 to 1500 B. t. u's. Each**..**$1.85**

55M5 Burners, Fletcher. Same as 55M4, except with **plain top. For all gases,** including straight and mixed natural, **up to 800 B. t. u's. Each**.......................**$1.50**

55M6 Burners, Boyce, P. G. E. Top. Needle valve gas control plus a screw type air regulator, allow a sufficiently wide range of adjustments for efficient operation on various gases. Mixing tube, ½ inch in diameter, air regulator and needle valve are brass. One piece base, gas chamber and hose connection are cast iron, finished in baked-on japan. Height, 5½ inches. **For all gases,** including straight and mixed natural, **up to 1200 B. t. u's. Each**................**$1.00**

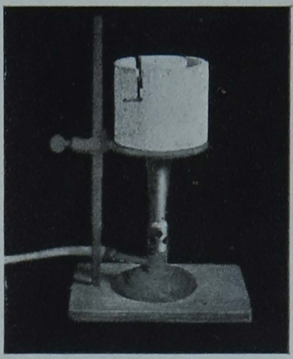
55M7 Burners, Boyce. Same as 55M6, except with plain top and mixing tube, 7/16 inch outside diameter. **For all gases,** including straight and mixed natural, **up to 800 B. t. u's. Each**...**$ .70**

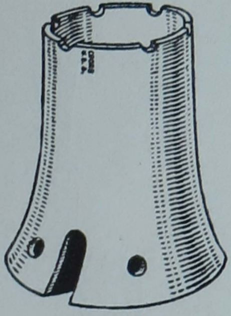

55M8


55M9

55M8 Burners, Micro, P. G. E. Top. Orifice and air port in each burner are fixed, predetermined for the kind of gas to be burned. The burner tube will not clog, being open at the bottom to allow small particles to drop through. All brass, nickel plated. Height, 2½ inches; base diameter, 2⅛ inches; inlet, 1½ inches long; mixing tubes, ¼ inch outside diameter. **For all gases above 750 B. t. u's,** including straight or mixed natural and cylinder gases. **Specify kind of gas. Each**..................................**$ .90**

55M9 Burners, Bunsen, Low Form. Fixed orifice; sleeve type air shutter; stamped steel unbreakable base, 3 inches in diameter, with baked-on enamel. Overall length, 6 inches; height, 2⅝ inches; brass mixing tube, 7/16 inch outside diameter. **For all gases up to 600 B. t. u's. Each**.......**$ .65**


55M10


55M12

55M14

55M10 Burner Flame Collars, Alundum. Withstands the highest temperatures obtained with laboratory burners. The supporting triangle fits into the slots, holding the crucible in the center of the space, so that a maximum heating effect is produced. A hole is placed in the side of the collar as a support for the Smith crucible, used in alkali determinations. Diameter, 3¼ inches; height, 3 inches. **Each**........**$2.60**

55M11 Burner Flame Collars, Coors Porcelain. Size 1. Diameter, 95 mm.; height, 90 mm. **Each**...........**$ .80**

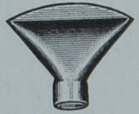
55M12 Burner Chimneys, Coors Porcelain. Used in producing a flame of high temperature, such as is required for determination of ash and volatile matter of coal. **Each**.**$1.75**

55M13 Burner Chimneys. Same as 55M12, except made of porous clay. **Each**.................................**$ .75**

55M14 Burner Chimneys. Armco iron with support, for tubes 7/16 to ½ inch outside diameter. Height, 2⅛ inches. **Each**...**$ .60**

55M15

55M17


55M19

55M21

55M22

55M15 Burner Crown Tops. Breaks up flame into 7 intense jets. Increases heat by about 30°, and holds flame to the burner. Recommended for gases which tend to "blow off" as gas input is increased. Nickel plated brass. For tubes 7/16 inch outside diameter. **Each**.......................**$ .20**

55M16 Burner Crown Tops. Same as 55M15, except for tubes, ½ inch outside diameter. **Each**..............**$ .25**

55M17 Burner Tips. With rest for blowpipe. For tubes 7/16 inch outside diameter. **Each**.....................**$ .15**

55M18 Burner Tips. Same as 55M17, except for tubes ½ inch outside diameter. **Each**.....................**$ .18**

55M19 Burner Wing Tops. Made of seamless brass. For tubes 7/16 inch outside diameter. **Each**..............**$ .10**

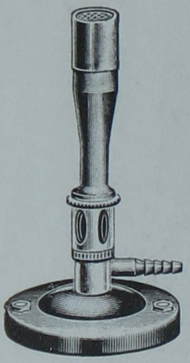
55M20 Burner Wing Tops. Same as 55M19, except for tubes ½ inch outside diameter. **Each**..............**$ .15**

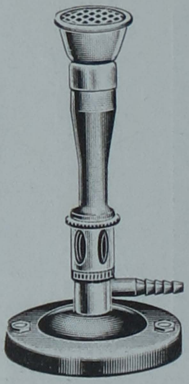
55M21 Burner Wing Tops. Same as 55M20, except with 1¼-inch extension for use on P. G. E. Top burner. **Each**...**$ .20**

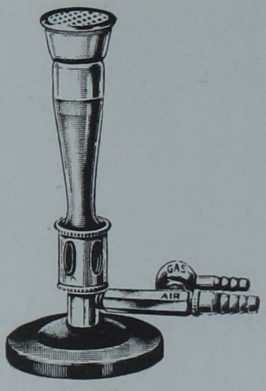
55M22 Burner Gauze Tops. Intensifies and widens flame; eliminates the cold cone. For tubes 7/16 inch outside diameter. **Each**...**$ .35**

55M23 Burner Gauze Tops. Same as 55M22, except for tubes ½ inch outside diameter. **Each**...............**$ .40**

Burners, Continued


56M1


56M2



56M3

Burners, Meker. These all purpose utility burners are safe, thoroughly economical and ruggedly constructed. They produce powerful, flexible flames, short and wide, large in area—free from back flash at almost blast intensity, without a central cold cone.

Gas flow through a machine-made venturi throat entrains primary air at high velocity insuring an intimate air-gas mixture for efficient combustion. Five large air ports allow very close air regulation. All parts are made of heavy brass, corrosion resistant.

56M1 Burners, Meker. With regular top, honey-comb nickel grid and 2 extra orifices. **For artificial gases from 480 to 600 B. t. u's.**

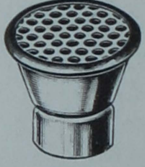
Size	**2**	**3**	**4**	**5**
Diameter, grid, inches	¾	15/16	1 3/16	1⅝
Diameter, base, inches	3	3	3⅝	4¼
Height, inches	5½	5½	7⅜	9⅜
Each	**$1.85**	**2.25**	**2.60**	**5.50**

56M2 Burners, Meker. With **Monel metal heat intensifier top** and 2 extra orifices. **For all gases except artificial, above 600 B. t. u's.**

Size	**2**	**3**	**4**	**5**
Diameter, grid, inches	1	1 5/16	1½	2
Diameter, base, inches	3	3⅝	3⅝	4¼
Height, inches	6⅛	6⅜	8⅜	10⅝
Each	**$2.00**	**2.40**	**2.85**	**6.00**

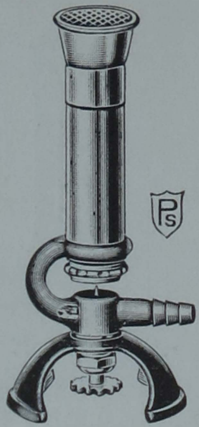
56M3 Burners, Meker, Blast. Monel metal heat intensifier tops. A powerful burner for such work as ash determinations, ignitions of precipitates, peroxide fusions, etc. Gas is entrained by the air stream at high velocity, and a proper ratio of air to gas is automatically secured as pressure of air blast is varied through the aspirator inlet. Maximum attainable temperature requires an air blast not exceeding 2 pounds in pressure. All brass body and stamped brass base. **For all gases, including straight or mixed natural and cylinder gases.** Size Number 2, with inlet 3¾ inches long. **Each** **$3.15**

56M4 Burners, Meker. Same as 56M3, except Size Number 4, with inlet 3¾ inches long. **Each** **$4.75**

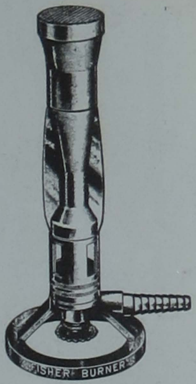

56M5

56M5 Burner Top, Heat Intensifier. Greatly improves Meker Burners. For use on straight or mixed natural and cylinder gases. Flame is intensely hot, large, steady, with no cold cone. A Number 3 Meker will boil 250 ml. of water in 2½ minutes—a Number 4, in 80 seconds. Made entirely of **Monel metal,** with perforated top, and a fine gauze screen inside.

Size	**2**	**3**	**4**	**5**
Diameter, inches	1	1 5/16	1½	2
Diameter, inside bottom, inches	¾	15/16	1 3/16	1⅝
Each	**$ .80**	**1.00**	**1.10**	**1.50**



56M6

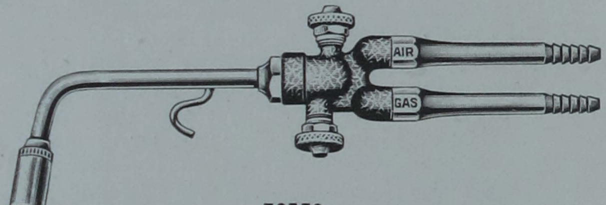


56M7

56M6 Burners, High Temperature. Monel metal heat intensifier top. A very powerful, flexible and rugged burner for heavy duty work. Produces a flame intensely hot, large, steady, free from back flash and with no cold cone. Double barrel mixing tube operates on the venturi principle. All parts of heavy brass except 3⅝-inch diameter base, which is cast iron, black japanned. **For straight and mixed natural and cylinder gases of 600 B. t. u's. or more per cubic foot. Each** **$2.25**

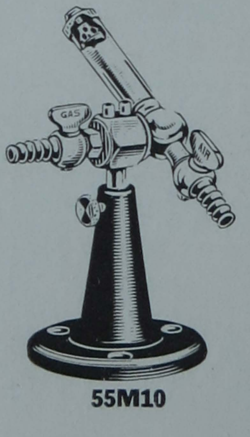
56M7 Burners, High Temperature, Fisher. These highly efficient burners are made of non-rusting materials throughout. The 42 mm. grid and well-designed mixing tube provide an intensely hot, steady flame with no cold cone. An adjustable packing gland eliminates any possibility of gas leaks. **For all gases, including straight and mixed natural and cylinder gases. Each** **$2.00**

56M8 Burners, High Temperature, Fisher. Similar to 56M7, except with 30 mm. grid and for use with artificial gases. **Each** **$1.75**



56M9

56M9 Burners, Blowtorches. Nicely balanced, light in weight, small though powerful; easy to control. Operates efficiently on **any kind of gas including compressed cylinder gases or hydrogen;** using oxygen or compressed air. Each blowpipe includes three interchangeable tips as follows: 1—For gas and oxygen or hydrogen and air; produces a temperature high enough for working platinum. 2—Small tip for gas and compressed air produces a fine, needle-point flame. 3—Large tip for gas and compressed air produces a moderate or large brush flame. Compressed air pressure from 2 to 10 pounds is sufficient. With dual micrometer needle valves for gas and compressed air or oxygen; length, 9½ inches. **Each** **$6.50**

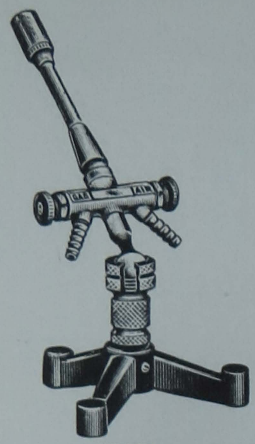


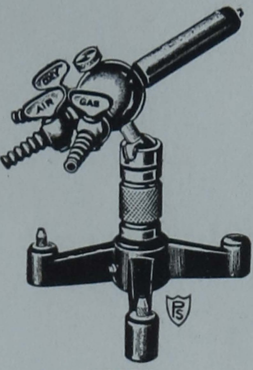
55M10

56M10 Burners, Bunsen Blast. For artificial gases up to 600 B. t. u's. Adjustable burner tube directs flame at any angle. Three tips of different size openings regulate the flame from a fine point to a large brush. Especially adapted for glass blowing. Maximum height, about 9 inches. **Each** **$4.00**

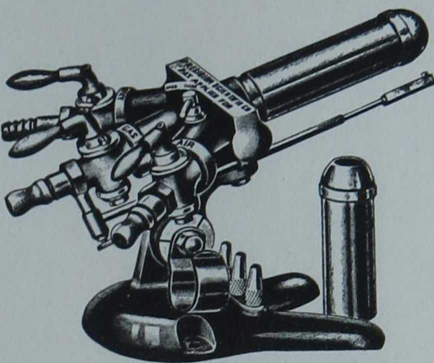
56M11 Burners, Bunsen Blast. Similar to 56M10. **For artificial, all mixed or straight natural gases,** using air or oxygen blast. Equipped with needle valve "bleeder" for pre-mixing air with the gas when using gases higher than 750 B. t. u's. **Each** **$6.00**

Burners, Continued


57M1



57M5


57M6

57M1 Burners, Blast Utility, M. I. T. Type. For all mixed and straight natural and cylinder gasses. Micrometer adjustment of both gas feed and blast stream. Removable tip produces a large size flame using gas and air which can be replaced by a smaller tip for gas and air, or a tip for gas and oxygen. Burner can be in any position—vertical, at any angle, or horizontal through a full circle of 360 degrees. Heavy iron base; all other parts nickel plated brass, except tip which is natural brass. Complete with tip 57M2. **Each** **$7.50**

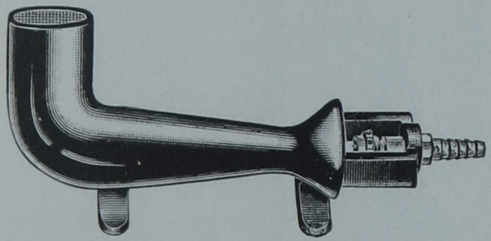
57M2 Large Gas-Air Tip Only. For 57M1. **Each** **$1.25**

57M3 Small Gas-Air Tip Only. For 57M1. **Each** **$1.25**

57M4 Gas-Oxygen Tip Only. For 57M1. **Each** . . . . **$ .90**

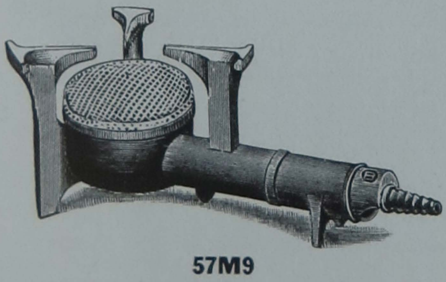
57M5 Burners, Blast, Junior Universal. Intended **for light duty with artificial, mixed or straight natural, or cylinder gases, using air, oxygen or both.** With three interchangeable blast nozzles, and a telescoping sleeve which fits over the burner mixing tube, facilitates the adjustment of flame characteristics in conjunction with the interchangeable blast nozzles. With universal ball-joint on detachable base, which is of heavy iron coated with baked-on japan. **Each** **$12.00**

57M6 Burners, Blast, Heavy Duty Universal. Flame can be varied from a fine needle point to a brush flame 2 inches wide and 16 inches long; will operate with high efficiency on any kind of gas. Equipped with pilot light, two interchangeable telescopic sleeves, three interchangeable orifices. Can be used with compressed air and gas, oxygen and gas, or with all three. Is adjustable on base to any angle, up or down, and pivots from side to side. Made of brass and mounted on japanned base. Diameter of burner tube, 30 mm.; maximum height, about 9 inches. **Each** **$28.50**


57M7

57M7 Burners, Bunsen.* Produces a 2-inch (50 mm.) diameter flame, intensely hot throughout, with no cold cone. Heavy cast iron construction, finished in baked-on heat-resistant japan. Length, 12½ inches; height, 5 inches. With adjustable Fletcher Type orifice **for all gases, including straight or mixed natural, up to 1200 B. t. u.'s. Each** **$4.50**

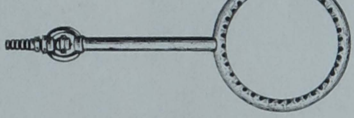
57M8 Burners, Bunsen.* Same as 57M7, except with stopcock. **Each** **$5.25**


57M9

57M9 Burners, Solid Flame.* For natural or artificial gases. Japanned iron; 3¼ inches diameter; with nipple . **$2.10**

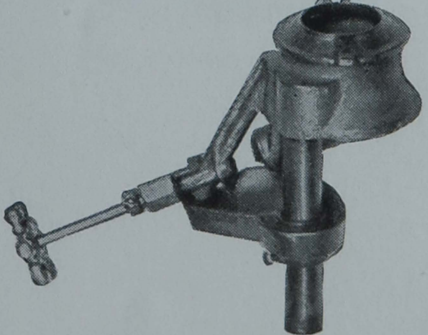
57M10 Burners, Solid Flame.* Same as 57M9, except 4¼ inches diameter **$2.80**

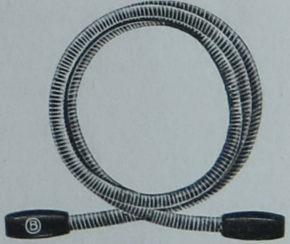
* When ordering above burners, please **specify kind of gas** to be used.


57M11

57M11 Burners, Ring. All-brass, heavy wall seamless tubing. With Fletcher Type adjustable gas and air regulator. Flame holes on top. Finished in black japan. **For all gases, including straight or mixed natural, and cylinder gases.** Size 4; inside diameter, 3 9/16 inches; shank length overall, 9¼ inches. **Each** **$2.50**

57M12 Burners, Ring. Same as 57M11, except size 5; inside diameter, 4½ inches. **Each** **$2.75**

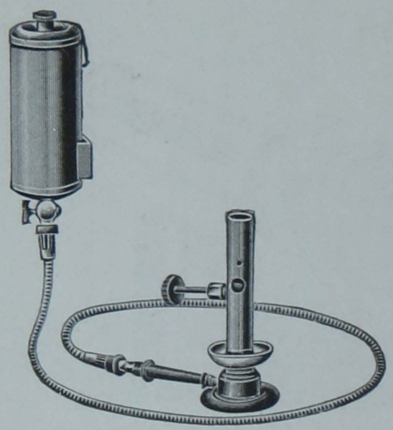

57M13


57M14

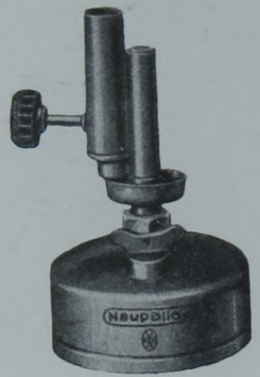
57M13 Burners, Gasoline, for Hot Plates. Can be mounted singly or in groups; used with pressure tanks or gravity feed. Will operate on any good grade of gasoline ("high test" is recommended). ¼-inch I. P. S. thread. **Each** **$5.00**

57M14 Burner Connections. Flexible Metallic Tubing. In 3-foot lengths. With rubber connectors, ⅜-inch inside diameter at both ends. **Each** . . . . **$ .40**

Burners, Continued



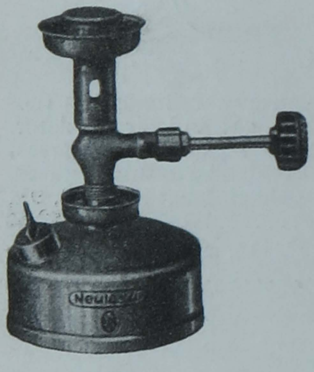
58M1



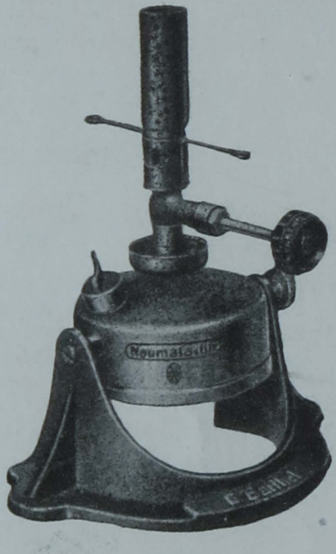
58M2

58M1 Burners, Alcohol, Bunsen. Non-explosive. Ideal for field or laboratory use. Produces a safe, easily regulated, blue smokeless flame of high temperature. Needs no wick. Will burn 4 to 5 hours on one filling of the quart capacity fuel tank. Burner is of heavy brass with fibre knob on needle valve, and japanned iron base. Burner height, 7½ inches; tube, 1 inch outside diameter. Includes 5 feet of flexible metallic tubing. **Each** **$10.00**

58M2 Burners, Alcohol, Blast. Recommended for annealing, calcinations, etc. It gives a hot, blue flame. There is no soot, no vaporization of fuel when not in use. Capacity of brass container, ½ pint. One filling at full flame burns 1¼ hours. Height, 7 inches; temperature, 1200° C. **Each** . **$7.75**



58M3

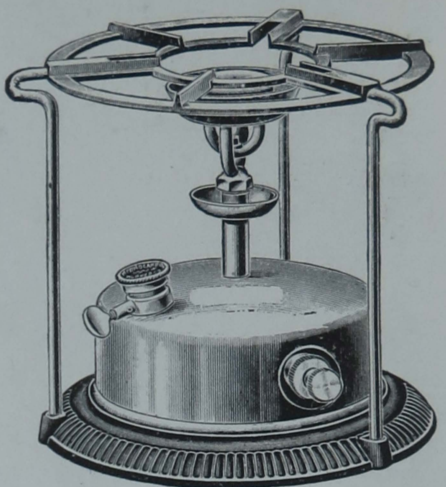


58M4

58M3 Burners, Gasoline, Barthel. Steady, nearly noiseless flame of intense heating capacity. Temperature, 1400° C. Capacity of polished brass container, ½ pint. One filling, full flame, burns 1¼ hours. **Each** **$9.00**

58M4 Burners, Gasoline Blast. Burner tube and flame can be adjusted at any angle, vertical or horizontal. Such variation in direction is of great advantage with some analytical operations; melting and bending glass tubes, etc. Air supply and flame adjustable by means of a movable sleeve; regulating spindle permits a direct setting of the flame. **Each** . . . **$12.00**

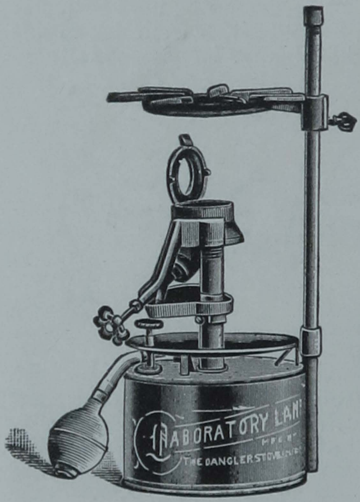
> We are thoroughly familiar with export regulations and with packing of materials to meet ocean shipment requirements.



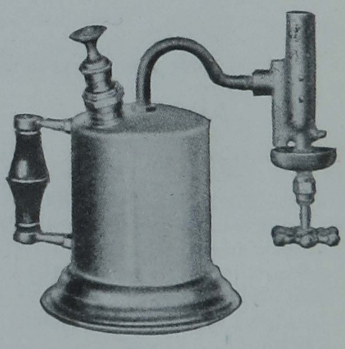
58M5

58M5 Burners, Kerosene, Blast. Generates its gas by forcing kerosene vapor through a burner which has been preheated. Gives a hot blue flame, without smoke or odor, which will boil a quart of water in three minutes.

Reservoir is made of heavy polished brass and the top ring of stamped steel. Capacity, 1 quart; consumption in three hours, 1½ pints; net weight complete, 2¾ pounds. **Each** **$8.50**



58M6



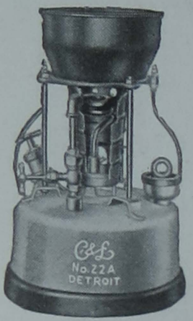
58M9

58M6 Burners, Gasoline (Dangler Lamps). Especially designed for laboratory use. Provided with strong support rod and adjustable grate. Rubber bulb supplies sufficient pressure to generate an intense vapor fire of 1100° F. With ½ gallon copper tank. Complete with support and grate. **Each** **$15.00**

58M7 Burners, Only. For above lamps. Without support, tank and grate. **Each** **$5.00**
58M8 Grates, Only. For above lamps. **Each** .... **$ .75**

58M9 Burners, Gasoline, Laboratory Torch. Built to rigid requirements and especially delicate in its adjustments. Burner is vertical and the powerful blast flame can be regulated to a small pointed or brush flame at will—can be placed under a tripod or ring stand for heating laboratory vessels. Capacity, 1 pint. **Each** **$7.50**

Burners, Continued

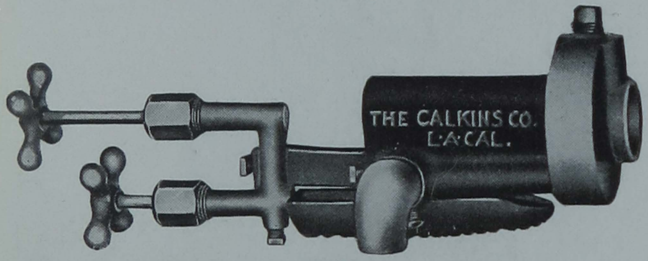


59M1

59M2

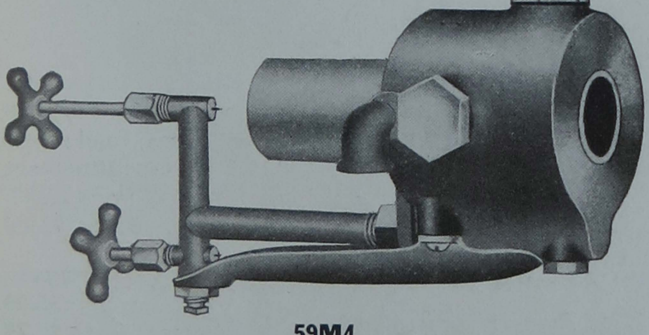
59M1 Burners, Gasoline Retort Furnace. For mercury retorts of 2-quart capacity and smaller. Also suitable for other purposes, both in the field and laboratory. All parts rugged and easily cleaned. Shell: inside diameter, 6½ inches; depth, 4 inches. Tank capacity, 1 gallon. Net weight, 11 pounds. **Each** **$12.00**

59M2 Burners, Gasoline Retort Furnace. For mercury retorts of 2-gallon capacity and smaller. Also suitable for any purpose where an exceptionally rugged and powerful burner of this type is required, either in the field or in the laboratory. Burner is fully protected from wind and weather; and is easily disassembled for cleaning. Shell: inside diameter, 11½ inches; depth, 6 inches. Fuel consumption, ¼ gallon per hour. Tank capacity, 1½ gallons. Net weight, 15 pounds. **Each** . . **$26.50**



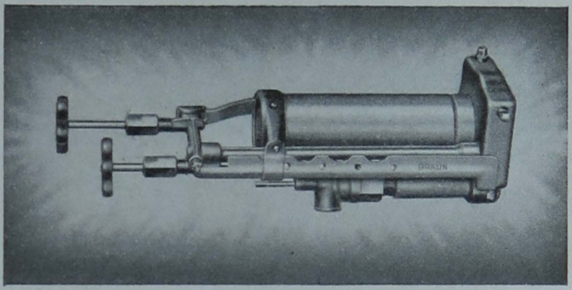
59M3

59M3 Burners, Gasoline, Hydro Carbon, Advance. Very efficient. Made of solid copper casting. No parts to work loose or twist out of alignment. It will operate a furnace of pot type having a capacity up to five 20-gram crucibles in the fire chamber and 12 cupels in the muffle. Diameter of combustion tube, 1⅛ inches; diameter of face, 2¾ inches; total length, 10½ inches. Net weight, 4 pounds. **Each**. **$9.00**



59M4

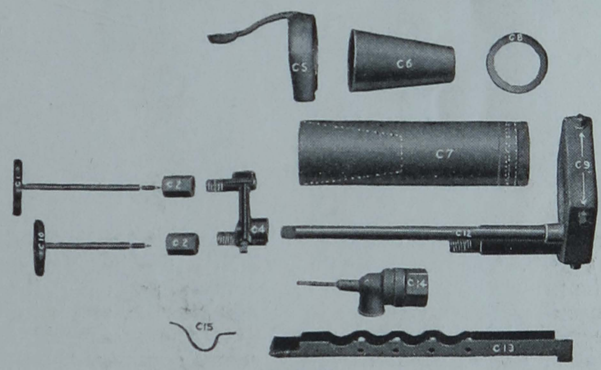
59M4 Burners, Gasoline, Hydro Carbon, Challenge. Main part consists of one single copper casting. So constructed as to avoid deposition of tar in ducts and needle valve outlets. Burner can be dismantled easily for cleaning. Will operate furnace of pot type having a capacity up to ten 20-gram crucibles in fire chamber and 18 cupels in muffle. Diameter, combustion tube, 1⅝ inches; diameter of face, 3⅝ inches; total length, 13 inches. Net weight, 9 pounds. **Each**...... **$18.00**



59M5

59M5 Burners, Gasoline, Cary Hydro Carbon, New Style. Scientifically constructed of the very best materials. Generating tube is of very heavy drawn brass tubing. Intake tube carries a filter and filters out any foreign matter in the gasoline. Needle valves are made with a flat shoulder to shut off gasoline supply, the needle portion being used only to clear out the orifice, thus orifice never becomes enlarged through use. The cone acts as an injector, causing the entrained air to be thoroughly mixed with the gasoline gas, thus producing complete combustion. Best results are obtained with from 35 to 40 pounds pressure in the fuel tank. Furnished in three sizes. Size is determined by the outside diameter of the mixing tube.

Size, burner, inches	**1½**	**2**	**2¼**
Fuel consumption, gal. per hour	½	1	1¼
Length, burner, inches	13½	15½	17
Weight, net, pounds	3⅞	4¾	5⅝
Weight, shipping, pounds	5½	6½	7
Each	**$13.50**	**16.00**	**17.50**

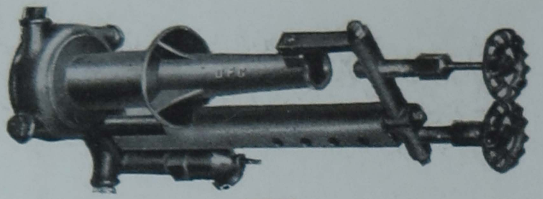


59M6

59M6 Renewal Parts for Cary Hydro Carbon Burner. Specify whether for old or new style, and the size of the burner.

C1	Main needle valve	**$ .50**
C2	Packing nut	**$ .25**
C3	Complete elbow and valves (Consists of C1, two of C2, C4, and C10)	**$3.00**
C4	Elbow casting	**$1.50**
C5	Collar and brace for mixing tube	**$1.00**
C6	Cone inside of mixing tube	**$1.00**
C7	Mixing tube	**$2.50**
C8	Retaining ring	**$1.00**
C9	Face screws. **Each**	**$ .10**
C10	Generating needle valve	**$ .50**
C12	Face with feed tube and intake tube brazed in	**$8.00**
C13	Generating trough	**$1.25**
C14	Elbow for gasoline intake, with adjusting valve	**$1.50**
C15	Strap for generator trough	**$ .25**

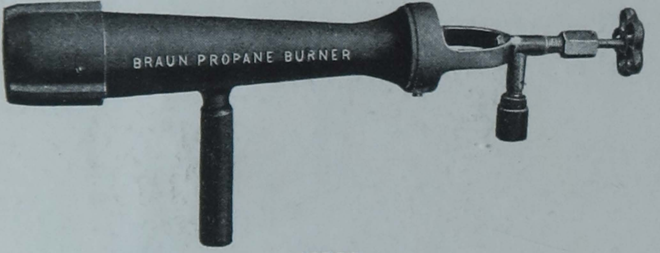
Burners, Continued



60M1

60M1 Burners, Gasoline, Denver. Practical, economical and satisfactory burner for burning gasoline in assay, metallurgical and small industrial furnaces. Burner consists of a hollow phosphor-bronze casting which serves as a generator and nozzle; a two-stage inspirator which insures injection of sufficient air for complete combustion of the fuel, and a generating tube for starting the burner. The large frontal area of the generator which is in contact with the heat assures rapid and complete volatilization of the fuel. Removable plugs afford access to the generator chamber for cleaning. Operates on a gasoline pressure range of 30 to 60 pounds per square inch.

Size	**1**	**2**	**3**
Capacity, gallons, gasoline per hour	½	1	1½
Pipe size, inches	¼	¼	¼
Weight, pounds	6	8	10
Each	**$16.00**	**18.00**	**20.00**



60M2

Burners, Propane. For use with compressed cylinder (bottled) gases. A sliding sleeve makes it easy to adjust the burner to the proper position in the furnace opening. A pigtail tank connection, for convenience in changing tanks, and a burner boss are included in each burner outfit. The burner will operate at any gas pressure, but a pressure regulator should be used to secure the most economical and efficient performance with the various sizes of furnaces. The flow control valve which is included in the complete burner outfit, insures constant flow at the required volume. Burner has no annoying air adjustment. The force of the gas from the jet entrains air into the mixing chamber, which automatically provides just the right mixture for complete combustion.

60M2 Burners, Propane. Complete with burner boss, flow control valve, two elbows, one 2-inch nipple, one 12-inch nipple, and pigtail tank connection. **Each** **$16.00**

60M3 Burners, Propane. Same as 60M2, except without pigtail connection. **Each** **$15.00**

60M4 Burners, Propane. 60M2 burner only, without accessories. **Each** **$14.00**

60M5 Pressure Regulator. One pressure regulator only is required. The same regulator is used for either single or double hook-up. **Each** **$9.00**

60M6 Double Manifold. For two cylinder tandem connection, complete with two pigtail connections, two line valves, adapter for pressure regulator, and necessary elbows and nipples. **Each** **$8.00**

60M7 Pigtail Connection, Only. A separate pigtail connection is needed for each tank used. **Each** **$1.50**

Note: All fittings are for ¼-inch pipe.

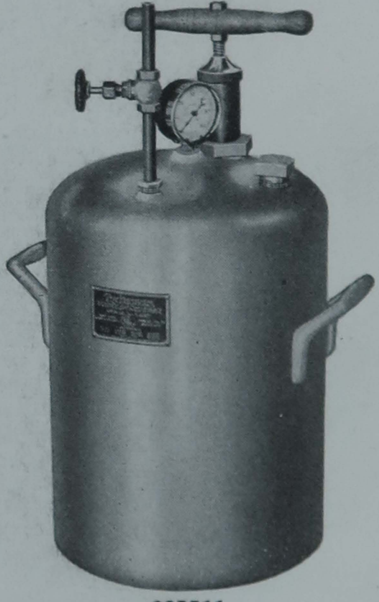
60M8

Burner Tanks, Gasoline. With welded steel, built-in pump, air gauge, air relief valve, filling cap, and valve with union connection for ¼-inch iron piping.

60M8 Burner Tank, 2-gallon. **Each** **$20.00**

60M9 Burner Tank, 5-gallon. **Each** **$28.80**

60M10 Burner Tank, 10-gallon. **Each** **$37.20**



60M11

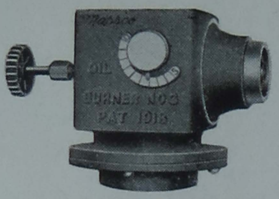
Burner Tanks, Gasoline. Exceptionally rugged and made of the very finest materials. Consists of a heavy seamless steel tank, tinned inside and outside to prevent rusting, and tested to 300 pounds pressure. A heavy brass air pump with check valve is built into the tank. An indicating pressure gauge and valve are furnished with each tank.

60M11 Burner Tank, 5-gallon. **Each** **$39.00**

60M12 Burner Tank, 10-gallon. **Each** **$46.50**

We are thoroughly familiar with export regulations and with packing of materials to meet ocean shipment requirements.

Burners



61M1

61M1 Burners, Massco, Low Pressure, Oil. Especially designed for assay muffle furnaces and melting furnaces. Burns light fuel oils down to 26° A. P. I. Low pressure air from the motor blower is utilized both for atomizing the oil and for combustion. The burner consists of a brass or cast iron head with a removable nozzle. Within this head, and extending into the nozzle, is an oil atomizing stem fitted with an oil control valve. Inside of the nozzle and surrounding the oil atomizer is an adjustable frustum of a cone, actuated by a rack and pinion connected to a knurled knob on the side of the burner. This knob is fitted with a ratchet and will remain in any position. The air for atomizing the oil passes through the center of the cone and is given a swirling motion by the vanes within the cone. The air for combustion passes between the nozzle and the cone, the amount being regulated by the position of the cone. This construction assures a constant maximum air pressure at the atomizing tip regardless of whether the burner is operating at full or a small per cent of its capacity. It further assures intimate mixing of the combustion air with the finely atomized oil.

Oil Consumption in Gallons per Hour

Air Pressure per Sq. Inch		Burner Size				
		1	2	3	4	5
6 Ounces	Max.	2.8	3.4	5.7	13.7	28.0
	Min.	.5	.5	1.0	4.3	7.0
8 Ounces	Max.	3.3	4.0	6.6	15.0	32.3
	Min.	.6	.6	1.2	5.0	8.2
10 Ounces	Max.	3.7	4.4	7.4	16.8	36.2
	Min.	.7	.7	1.3	5.6	9.2
12 Ounces	Max.	4.1	4.8	8.1	18.3	39.6
	Min.	.8	.8	1.4	6.1	10.0
16 Ounces	Max.	4.7	5.6	9.3	21.2	45.7
	Min.	.9	.9	1.7	7.0	11.5
24 Ounces	Max.	5.7	6.9	11.4	27.1	56.2
	Min.	1.1	1.1	2.1	8.6	14.2
32 Ounces	Max.	6.6	8.0	13.2	30.1	64.7
	Min.	1.3	1.3	2.4	10.0	16.3

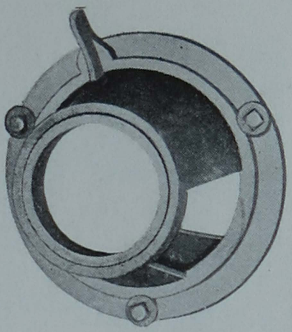
The oil consumption at 5000 feet altitude is about 83% of that shown in the above table.

Air Requirements Cubic Feet per Minute

Air Pressure per Sq. Inch		Burner Size				
		1	2	3	4	5
6 Ounces	Max.	67	80	133	320	655
	Min.	13	13	24	101	165
8 Ounces	Max.	77	92	153	350	754
	Min.	15	15	27	116	190
10 Ounces	Max.	86	103	172	393	846
	Min.	16	16	31	130	213
12 Ounces	Max.	94	113	188	429	925
	Min.	18	18	33	142	233
16 Ounces	Max.	109	130	217	495	1068
	Min.	21	21	39	164	268
24 Ounces	Max.	133	160	266	608	1310
	Min.	25	25	47	201	330
32 Ounces	Max.	155	185	308	707	1510
	Min.	29	29	55	233	381

Size	**1**	**2**	**3**	**4**	**5**
Size, air pipe, inches	2	2	3	4	5
Size, oil pipe, inches	½	½	½	½	½
Each, without tuyere	**$22.50**	**22.50**	**25.00**	**30.00**	**40.00**

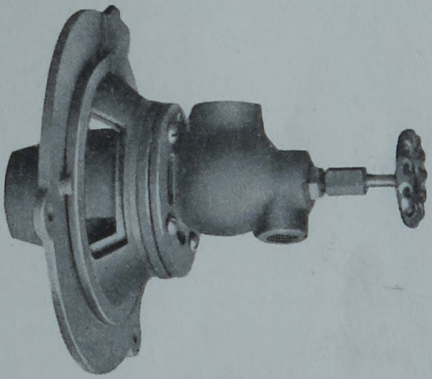
For tuyeres, see 61M2; for electric motor blowers for use with these burners, see page 35.



61M2

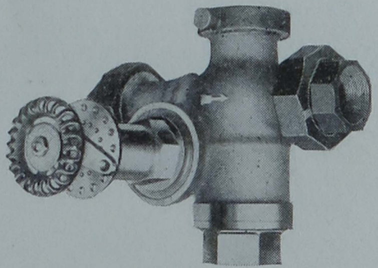
61M2 Burner Tuyeres, Oil. For use with 61M1 Low Pressure Burners. Consists of a cast iron frustum of a cone with an opening on two sides and a flange at the base for attaching tuyere to burner port or furnace wall. An adjustable sleeve fits over the cone providing a means for adjusting the amount of secondary air entering the furnace.

Size	**1**	**2**	**3**	**4**	**5**
Each	**$1.75**	**1.75**	**2.50**	**3.50**	**6.00**



61M3

61M3 Burners, Medium Pressure Oil. A simplified, inexpensive burner. For oil fired furnaces. Requires a positive blower similar to that shown on page 35, or where a good supply of compressed air is available, a regulating valve as illustrated below, 61M4, is necessary. This burner is fitted with a special tuyere so that the auxiliary air used is under perfect control. **Each** **$22.50**



61M4

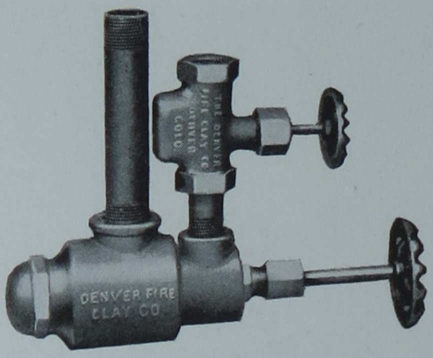
Burner Regulators for Medium Pressure Burner. For reducing the pressure from a compressed air supply to a pressure suitable for the above medium pressure burners.

61M4 Burner Regulators. ½-inch pipe connection for single-muffle furnaces. **Each** **$45.00**

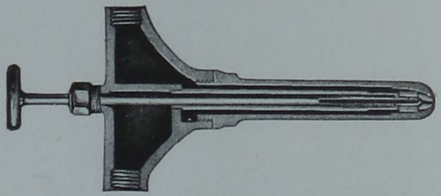
61M5 Burner Regulators. ¾-inch pipe connection for two-muffle furnaces. **Each** **$50.00**

61M6 Burner Regulators. ¾-inch pipe connection for three-muffle furnaces. **Each** **$56.00**

Burners, Continued



62M1



62M2

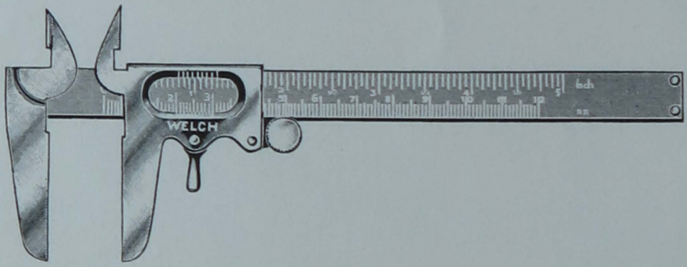
62M1 Burners, High Pressure Oil. Recommended for firing large furnaces where the air for combustion of the fuel may be obtained by furnace draft. Burner is a flexible high pressure steam or air atomizing, outside mixing type. Either light or heavy oil, if heated, may be burned.

The design of the atomizing tip is such that the maximum available pressure of the atomizing agent is always utilized, assuring complete atomization of the oil with a minimum consumption of steam or air. Complete with built-in air and steam regulating valve and with special oil regulating valve.

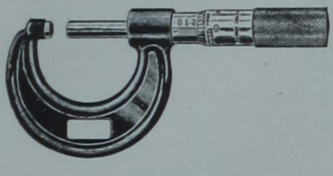
Size	**1**	**2**
Air pipe size, inches	¾	1
Oil pipe size, inches	½	¾
Fuel consumption, gallons of oil per hour with:		
Air at 40 pounds per square inch	15	38
Air at 80 pounds per square inch	30	75
Each	**$25.00**	**30.00**

62M2 Burners, Gem Oil. For oils between 18 and 25° Baume such as fuel oils, residuum of oil refineries and crude oils. Made of cast iron with brass tip and tube. The oil enters at one side of the burner and passes out through the inner tube. Steam is admitted from the opposite side, and surrounding the inner tube heats the oil as it passes through. The jet formed at the outlet atomizes the oil. A whirling motion is given the steam by a whorl placed near the outlet, which adds to the atomizing effect and delivers the oil in a fine spray or vapor which insures perfect combustion. A needle valve makes possible a close regulation of the oil supply. Its point is well supported and can not sag when hot, thus insuring its exact centering on the bearing. The valve rod is free to expand back of the threads and can not bind. Burners may be arranged in batteries to give any desired amount of heat. Complete, for ½-inch pipe connections. Net weight, 5 pounds. **Each** **$7.75**

Calipers



62M3



62M5

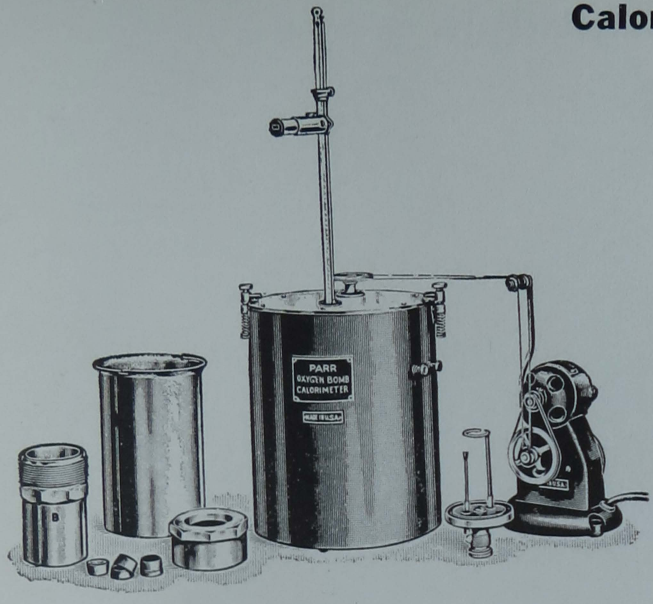
62M3 Calipers, Vernier, Metric and English. Inside and outside, with depth gauge. With convenient knurled wheel for easily moving the jaws. Locking lever provided to arrest further motion. Range, 0 to 12 cm. by $\frac{1}{10}$ mm. and 0 to 5 inches by $\frac{1}{128}$ inch. In case. **Each** **$2.80**

62M4 Calipers, Vernier, Metric and English. Same as 62M3, except without knurled wheel for moving the jaws, and with screw lock instead of lever lock. Range 0 to 10 cm. by $\frac{1}{10}$ mm. and 0 to 4 inches by $\frac{1}{128}$ inch. In case. **Each** **$2.00**

62M5 Calipers, Micrometer, English. The frame and thimble is a special semi-steel casting, chromium plated. The anvil spindle and micrometer screw are of hard tool steel. Range, 0 to 1 inch by 0.001 inch. Complete with ratchet stop. **Each** . . **$4.00**

62M6 Calipers, Micrometer, Metric. Same as 62M5, except graduated in metric units. Range, 0 to 25 mm. in 0.01 mm. Complete with ratchet stop. **Each** **$4.00**

Calorimeters



63M1

Calorimeters, Oxygen Bomb, Parr. For calorific determinations of fuel. Bomb, fuel capsule and valve are made of solid illium, an alloy specially developed to resist high pressure and corrosive acids. Illium lock-nuts holding the terminals are designed for rigidity and strength. Screw-cap, which holds the cover firmly in place over bomb, is made of chromium-plated bronze, since it does not come in direct contact with products of combustion. Small feet are provided on bottom of bomb for easy and accurate centering in assembling the calorimeter and for complete circulation of water. A double-walled Bakelite jacket, enclosing a dead air space on all sides, top and bottom, provides the insulation necessary for reducing radiation to a minimum. A stirrer, completely insulated from the outside drive wheel, circulates the water thoroughly without a measurable temperature increase. One thermometer only is required. It is graduated in 0.05° F., carefully calibrated, with National Bureau of Standards certificate and correction chart. A reading lens is supplied, also.

In operation of the calorimeter, the usual procedure of sampling, drying, etc., is followed. A weighed charge is placed in the capsule; the fuse wire is properly located; and a few drops of distilled water are added to the bomb, after which it is sealed. Bomb is properly located in the calorimeter; the stirrer is started; and the temperatures are noted. When the temperature change, due to radiation, becomes constant, the charge is electrically ignited. Readings of the thermometer are taken to ascertain the maximum rise and the subsequent drop caused by radiation. Washings from the bomb are collected and, by titration, the acid produced in the combustion process is determined.

The heat produced by the oxidation of any combustible liquid or solid can be checked within a difference of 0.3 per cent.

Calorimeter complete includes Illium bomb, Bakelite jacket and cover; certified thermometer, range 65 to 90° F. in $\frac{1}{20}$° graduations, with thermometer support rod; thermometer support bracket; pulley; oval water container; oxygen connection with gauge; valve and union; support for jacket cover; support for bomb cover; bench socket; locking hinge; thermometer reading lens; twelve gaskets for valve; six gaskets for union; six Illium fuel capsules; one card fuse wire; two thermometer support washers; blue-print for bench; and two direction booklets. Without motor or ignition unit.

63M1 Calorimeters, Oxygen Bomb, Parr. Single Valve. Each **$360.00**

63M2 Calorimeters, Oxygen Bomb, Parr, Double Valve. Each **$385.00**

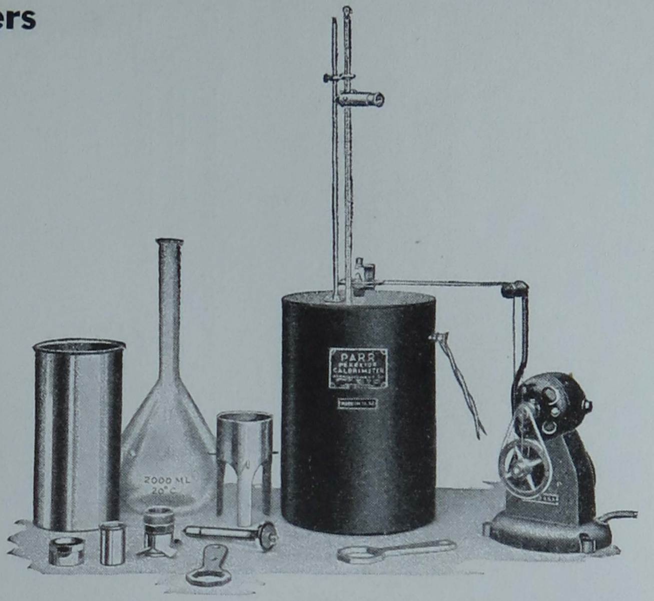
63M3 Ignition Unit. 110 volts. **Each** **$16.00**

63M4 Ignition Unit. 220 volts. **Each** **$18.00**

63M5 Ignition Wire. 10 cm. lengths on card; sufficient for 250 determinations. **Card** .... **$ .60**

63M6 Thermometer, Certified. Engraved stem. Range, 65° to 90° F. **Each** **$18.00**

63M7 Reading Lens. Each **$3.00**



63M8

63M8 Calorimeters, Peroxide Bomb, Parr. For calorific determinations of fuel. Useful also in making determinations for sulphur and total carbon in conjunction with the calorific determinations. The mixing of the charge with sodium peroxide, which readily gives up its oxygen to support the combustion of carbonaceous materials, insures the presence of a large excess of oxygen for the complete combustion of fuel. The success of this method of calorimetry depends upon the purity of the sodium peroxide. Therefore special calorimetric sodium peroxide in hermetically sealed tins, as well as a moisture-proof container for holding the contents of a tin when in use, is supplied. Potassium perchlorate as accelerator insures a quiet but complete fusion.

A removable fusion cup, nickel steel, is surrounded at the sides and bottom by a film of air. By this arrangement, the surrounding water is prevented from making direct contact with the fusion cup before ignition. The combustion, therefore, takes place within a vessel itself heated to redness, thus insuring a complete combustion. Air vents are arranged so that the heated air may escape. After one or two minutes' cooling, contraction of the remaining air occurs, and water is drawn into the chamber. In this way a good conductivity medium for the heat transfer is provided and a complete equalization of temperature is quickly effected. The total time from ignition to maximum reading averages about five minutes.

The fusion cups, being removable, may be placed flatwise in a beaker of 250 ml. capacity for easy and rapid dissolving of the fusion. The cups are interchangeable, and as many charges can be prepared as there are fusion cups available

The calorimeter jacket is made of two Bakelite cylinders with an air space between, which insulates the bomb and water container and reduces radiation to a minimum. A further reduction of radiation is accomplished by a Bakelite plate which automatically drops over the water container when the calorimeter cover is put in place. Four propeller blades are clipped onto the bomb, which is revolved at a rate of about 150 R. P. M. for efficient stirring of the water.

Accuracy is within 0.5%.

Calorimeter complete includes bomb assembled, Bakelite jacket complete with cover, rod and bracket; certified thermometer, range 65° to 90° F. in $\frac{1}{20}$° graduations; two thermometer support washers; pulley; two-liter water container; measuring dipper; measuring flask; bench socket; two cup covers; extra fusion cup; deflector tube; reading lens; camel's hair brush; four propeller blades clipped onto bomb; one card fuse wire; twelve extra gaskets; chemical jar; two ½-pound tins of sodium peroxide, one 3-ounce bottle of potassium perchlorate accelerator. Without motor. **Each** **$110.00**

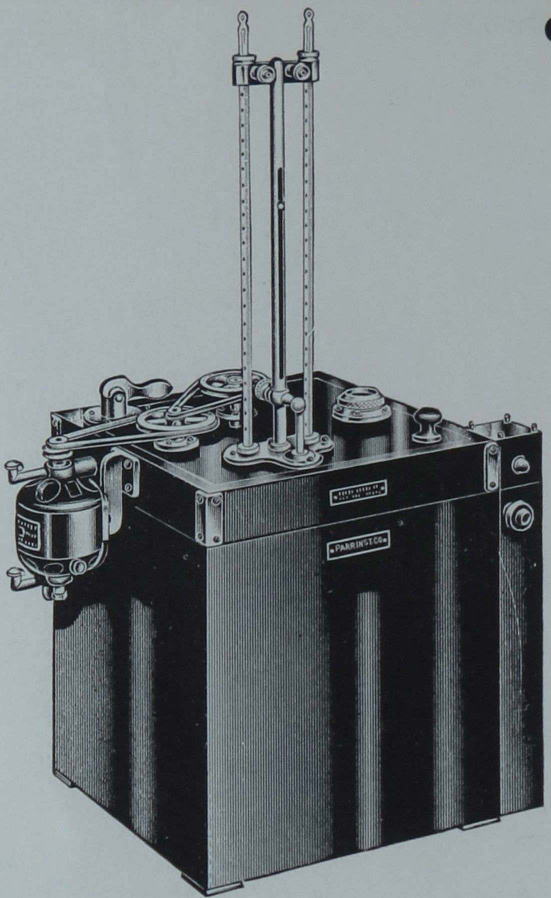
63M9 Ignition Wire. 7-cm. lengths on card; sufficient for 350 determinations. **Card** .... **$ .60**

63M10 Sodium Peroxide. In hermetically sealed tins. **½-pound tin** **$1.00**

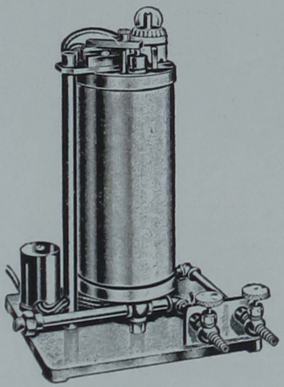
63M11 Potassium Perchlorate. 3-ounce bottle .... **$ .95**

Note: For laboratory motor for operating 63M1, 63M2 and 63M8, see page 67.

Calorimeters, Continued



64M1



64M3

Calorimeters, Adiabatic Oxygen Bomb, Parr. For the determination of thermal values of combustibles. Combustion of a sample is carried out in a closed vessel or bomb containing oxygen under pressure. Bomb is submerged in water in an oval bucket. This is completely surrounded by a water jacket. Such arrangement permits accurate measurement of slight temperature changes in the known mass of water in the bucket.

Given the recorded rise in temperature of a known mass, due to complete combustion of a weighed sample, the available heat units may be determined by a simple calculation. Precision of results depends upon avoidance of errors in accounting for all heat produced by the combustion.

The bomb is made of Illium, a dense, tough, non-corrodible alloy which resists the action of hot dilute nitric and sulphuric acids under pressure. Ignition of the sample within the bomb is by electric fuse. Either of two types of bomb may be obtained. Model B has a single valve, and the cover is screwed down with a long-handled wrench. Model BB bomb has two valves, and the cover is self-sealing without the use of a wrench. The internal volume of either bomb is 380 ml.

The oval bucket is made of brass, chromium plated and polished. A sleeve of hard rubber at the top provides a shoulder for suspending the bucket within the jacket. This avoidance of metallic contact eliminates thermal errors due to conduction. There is a one-half inch air gap between the surrounding jacket and the sides and bottom of the bucket. The air in this gap cannot circulate, as the calorimeter cover acts also as a lid for the bucket. This prevents thermal errors due to evaporation.

The water jacket is made of brass, finished in white nickel plate, with outer casing of polished black Bakelite. Provision is made for circulation of the water through the cover as well as the sides and bottom of the jacket. This is accomplished by a lift pump driven by a motor mounted on the left side. Flow of the water is observed through a sight hole on the right. When the pump is stopped the water drains into the lower jacket and permits the cover to be swung aside for access to the interior. This arrangement allows control of the temperature on all sides of the oval bucket without sacrificing accessibility. When the cover is swung back to the closed position and seated by means of the cam lever, automatic couplings cause engagement of the pump pulley and stirrer pulley with their respective mechanisms below. These couplings are insulated with material of low thermal conductivity to prevent heat flux. Control of the jacket temperature is by means of hot and cold water injections, manually operated.

Ignition system is in the vertical control box on the right.

The solid two-stem engraved thermometers are matched to within .01° throughout their range of 65° to 90° F. as indicated by accompanying Bureau of Standards test certificates. Telescopic reading lenses are provided which facilitate reading to a fineness of .005° F. without errors of the parallax.

Specify current characteristics when ordering.

64M1 Calorimeters, Adiabatic Oxygen Bomb, Parr, Model DD, with Single Valve Bomb. Complete with water jacket and cover including oval bucket, motor, ignition unit, thermometer support, 2 pulleys with rubber belts for pump and stirrer; one Model B Illium oxygen bomb; 5 Illium fuel capsules; oxygen connection with gauge, valves and unions; ring support for bomb cover with rod and base; wrench and bench socket for bomb; 12 gaskets for bomb cover; 12 gaskets for bomb valve; 6 gaskets for bomb union; card of fuse wire; 2 thermometers; 2 reading lenses; 4 thermometer support washers; locking fork for oxygen cylinder; 2 direction booklets; and blue-print for bench. Without heater. **Each**..**$490.00**

64M2 Calorimeters, Adiabatic Oxygen Bomb, Parr, Model DD, with Double Valve Bomb. Same as 64M1, except with Model BB Illium oxygen bomb with clamp. Without bench socket and wrench. **Each**..**$515.00**

64M3 Electric Water Heater. For use with 64M1 and 64M2 calorimeters. For maintaining a small supply of hot water continually available at low cost and with a minimum of attention. With automatic regulator and two quick-action needle valves.

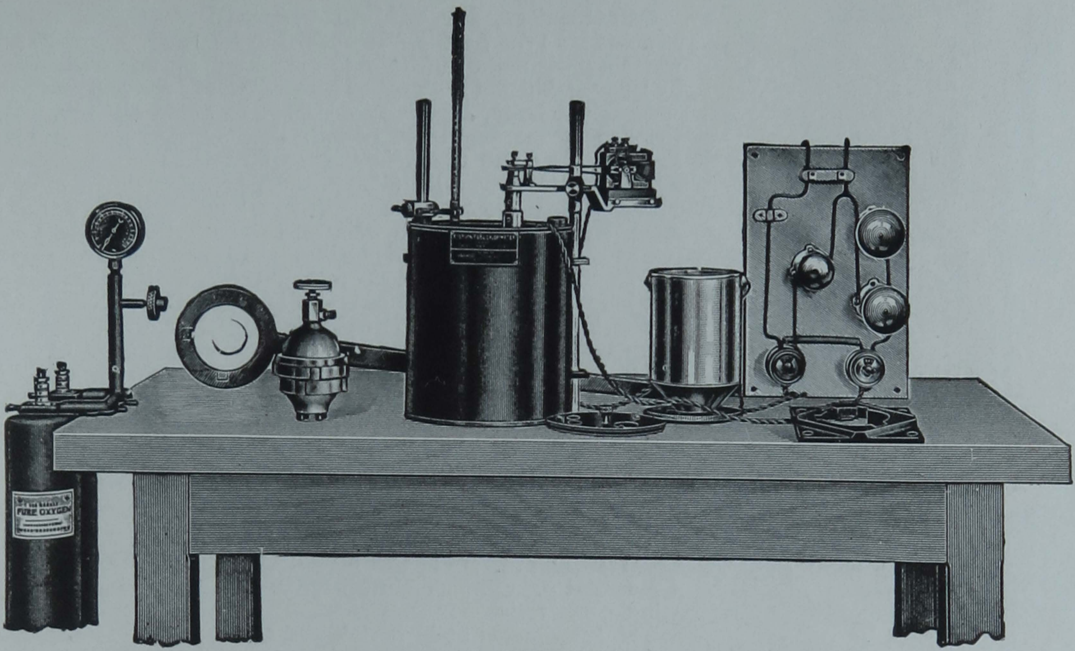
For volts	110	220
Each	**$35.00**	**37.00**

64M4 Ignition Wire. Card..**$ .60**

64M5 Thermometers, 65° to 90° F. With Bureau of Standards certificates and correction charts. **Pair**..**$36.00**

For calorimeter pellet press, see page 67.

Calorimeters, Continued



65M1

Calorimeters, Oxygen Bomb, Emerson. For solid and liquid fuels and other combustibles using oxygen gas under pressure. The bomb is made of stainless steel and spherical in shape with a capacity of 400 ml. and divided horizontally into hemispheres whose contact surfaces are accurately machined for closure by tongue and groove.

The jacket is sheet copper heavily lined with felt, which forms a nest for the heavy glass water container. The cover of the jacket is a disc of felt securely held between two metal plates. Two steel rods attached to the metal jacket furnish supports for the electric motor, stirrer and thermometer. The stirrer is of tubular form and its ball bearing shaft and paddles are actuated by a belt from an electric motor mounted at the other end of the stirrer bracket.

65M1 Calorimeters, Oxygen Bomb, Emerson, Single Valve. Complete with stainless steel bomb and interior fittings; calorimeter jacket consisting of copper outer container mounted on cast iron base; cylindrical glass jar as an interior container, with felt insulation between glass container and outer vessel; sheet metal cover with felt lining and with cover and posts; calorimeter bucket; oxygen piping with 1000-pound pressure gauge, for use with oxygen cylinders of Linde Products Company and Air Reduction Company; ball bearing stirring device belt driven by motor; special 3-foot spanner wrench and cast iron holder; water equivalent factor; thermometer holder; thermometer reader; ignition wire; gaskets; wire leads; etc. For operation on 110 volts, A. C. or D. C. **Each**........ **$290.00**

65M2 Calorimeters, Oxygen Bomb, Emerson, Double Valve. Otherwise, same as 65M1. The double valve makes it convenient for examining the products of combustion being exhausted from the bomb at any time. For operation on 110 volts, A. C. or D. C. **Each**........ **$310.00**

65M3 Calorimeters, Oxygen Bomb, Emerson, Single Valve, with Daniels Adiabatic Jacket. Otherwise, same as 65M1. With cover and posts. The Daniels adiabatic jacket accomplishes its purpose by heating the jacket water by approximately the same amount as the rise of temperature in the calorimeter during the combustion tests. The current is passed through the jacket water, thereby making the water its own heating unit. The jacket can be used only on A. C. and the voltage should not be in excess of 110 volts. **Each**........ **$320.00**

65M4 Calorimeters, Oxygen Bomb, Emerson, Double Valve, with Daniels Adiabatic Jacket. Otherwise, same as 65M3. **Each**........ **$340.00**

65M5 Bomb, Only, Single Valve. Made of special stainless steel with stainless steel interior fittings, and with wire leads, etc. **Each**........ **$137.50**

65M6 Bomb, Only, Double Valve. With stainless steel interior fittings. **Each**........ **$155.00**

65M7 Jacket, Regular. Glass lines; with posts, cover, calorimeter bucket and Bakelite support. **Each**........ **$47.00**

65M8 Jacket, Daniels, Adiabatic. With jacket cover, posts, bucket, felt covering, Bakelite support, etc. **Each**.... **$80.00**

65M9 Wire Leads for Firing Circuit. Complete Set........ **$2.55**

65M10 Fuel Pan, Regular, Nickel. Each........ **$ .50**

65M11 Gaskets, Lead. $3\frac{3}{16}$ inches in diameter. **Dozen**........ **$1.95**

65M12 Gaskets, Lead. For valve, ½ inch in diameter. **Dozen**........ **$ .55**

65M13 Gaskets, Lead. Between oxygen piping and oxygen cylinder, ¼ inch inside diameter. **Dozen**........ **$ .55**

65M14 Gaskets, Leather. Between bomb and oxygen piping, ⅛ inch inside diameter. **Dozen**........ **$ .55**

65M15 Gaskets, Lead. For insulation plug, ⅝ inch inside diameter. **Dozen**........ **$ .55**

65M16 Insulation Plug. Each........ **$4.75**

65M17 Motor for Stirrer. Each........ **$12.00**

65M18 Oxygen Piping, Single Arm. Includes gauge. For single valve bomb to fit Air Reduction or Linde cylinders. **Each**........ **$37.80**

65M19 Stirrer Belt. Each........ **$1.20**

65M20 Thermometer Clamp and Holder. Complete........ **$7.60**

65M21 Valve to Bomb. Complete, except hand wheel. **Each**........ **$5.60**

65M22 Valve Body. Each........ **$2.10**

65M23 Valve Packing Nut........ **$ .80**

65M24 Valve Nipple. Each........ **$1.05**

65M25 Valve Spindle. Stainless steel. **Each**........ **$2.25**

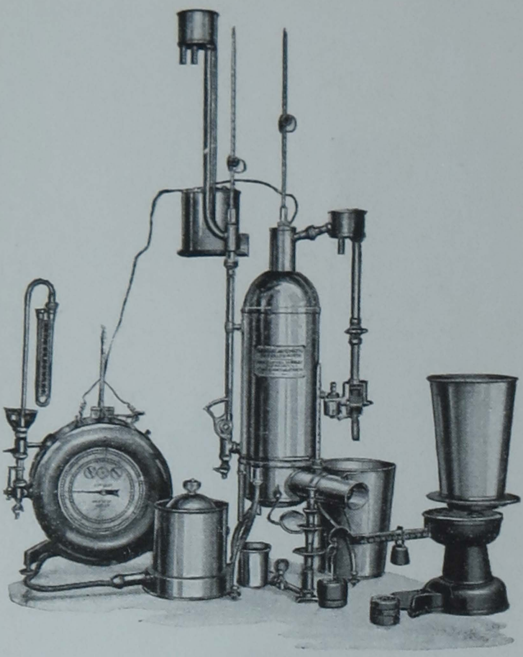
65M26 Valve Handle. Each........ **$1.35**

65M27 Valve Seat. Each........ **$ .35**

65M28 Wrench. For tightening bomb. 30-inch handle. **Each**........ **$13.50**

65M29 Wire, Iron Fuse. .004 inch in diameter. **Spool. $ .40**

Calorimeters, Continued



66M1

Calorimeters, Sargent, Automatic. For all combustible gases. Adopted as standard type by the American Gas Institute. Employs a direct method in which a measured quantity of gas is burned in the calorimeter. Heat generated by this combustion is absorbed by a stream of water flowing through a suitably constructed body, especially designed to avoid all heat loss, which water is weighed at the expiration period. The temperatures are read on Fahrenheit thermometers and the weighings made in avoirdupois pounds and fractions, thus permitting the calculation of the heat values directly in B. T. U.'s, without conversion. There are four main parts: gas meter, pressure regulator, calorimeter body complete with weirs and tipping device, and a scale with weights.

The wet test gas meter is calibrated to read 0.1 cubic foot per revolution in 0.001 cubic foot subdivisions with integrating dial recording up to 100 cubic feet before repeating. Entire meter is made of cold rolled brass and is heavily tinned inside to protect it from corrosion. The drum or rotor is accurately balanced on knife edges so that a water pressure of 0.1 inch is sufficient to rotate it. An electric switch operating the automatic water tipping device is closed as each 0.1 of a cubic foot of gas is burned. The meter is equipped with an armored thermometer in the exit line having a range from 40° to 110° F. in 1° subdivisions, two permanent spirit levels, three legs, two of which are fitted with leveling screws, filling funnel, outlet cock, drain plug, water gauge, pressure "U" gauge and an electric switch for closing circuit to water tipping device.

The pressure regulator is made of brass, heavily nickel-plated and polished. Controls the pressure of the gas entering the burner by means of a water seal. A constant pressure is maintained with small weights which slip over the valve spindle.

The calorimeter body is designed to permit ready access to all parts. The outer jacket is removed easily so that the inner tubes can be cleaned and repairs quickly made when necessary. The rate of flow of water through the jacket is adjusted easily by means of a quadrant cock and a constant level is maintained through the overflow weir, which provides a definite head of water in the calorimeter body at all times. Body is fitted with a mechanical tipping bucket, operated by dry batteries and an electro magnet, which automatically switches the heated water from one weighing pail to the other. Pails are counterpoised and made of nickel-plated brass. The electro magnet is controlled by the contact established on the meter at each revolution of the meter hand, which occurs every time 0.1 cubic foot of gas is passed. A hand swing-over device is also furnished.

The scale is equipped with weights and a slide on the beam. The quantity of water heated by each 0.1 cubic foot of gas is automatically measured off by weighing on this 10-pound scale, accurate to 0.01 pound.

Two special thermometers, 18 inches long, are supplied for measuring the inlet and outlet water temperatures; with ranges of 45° to 100° F. and 60° to 110° F. respectively, in subdivisions of 1/10° calibrated for total immersion. A thermometer graduated from 40° to 110° F. in 1° is provided also for taking temperature of the exhaust gas.

66M1 Calorimeters, Sargent, Automatic. Complete outfit includes calorimeter, chromium plated; automatic electric tipping bucket; swinging spot for manual change-over; wet test gas meter of 20 cubic feet per hour capacity with brass rotor, shaft and housing; chromium-plated wet type pressure governor with weights; scales with weights; pair of balanced chromium-plated weighing pails of 10-pound capacity with a single counterpoise weight; an inlet and an outlet water thermometer; an exhaust thermometer; two thermometer reading lenses; two dry cells in a chromium-plated container; electric cord for connecting tipping bucket to dry cells and meter; 3 lengths of approved A. G. A. gas tubing for connecting calorimeter burner to meter, pressure governor, and gas line; condensation beaker, cleaning brush for calorimeter flue, and one for cleaning calorimeter tubes; pad of 50 heat value test record sheets as recommended by the U. S. Bureau of Standards; and complete instructions for operating, including book of gas calorimeter tables—"U. S. Bureau of Standards Circular Number 65." **Each** **$295.00**

66M2 Calorimeters, Sargent, Automatic. Same as 66M1, except meter has a Monel metal rotor, shaft and housing. For testing gases of high sulphur content. **Each** **$310.00**

66M3 Calorimeters, Sargent, Automatic. Same as 66M1, except without meter. **Each** **$220.00**

66M4 Calorimeters, Sargent, Automatic. Same as 66M1, except in addition includes an aneroid barometer, sling hygrometer and special slide rule to simplify the computation of heat value. **Each** **$332.50**

66M5 Calorimeters, Sargent, Automatic. Same as 66M4, except meter has rotor, shaft and housing made of Monel metal. **Each** **$347.50**

66M6 Calorimeter Flue Columns. With complete set of flue tubes. **Set** **$37.50**

66M7 Calorimeter Weighing Pails. Supplied in balanced pairs with single counterpoise. Heavy copper, reinforced around rim, tinned inside, chromium-plated and highly polished outside. Water capacity, 10 pounds. **Pair** **$10.00**

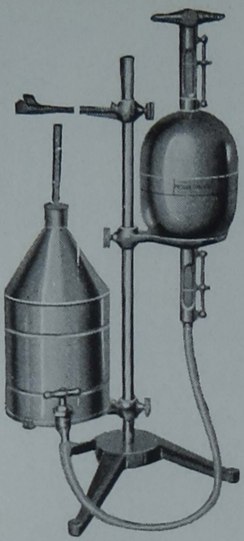
66M8 Calorimeter Weighing Scales. Sharp knife-edged fulcrums are hardened to resist wear. Readings to 1/100th-pound. Necessary weights are included. **Complete** **$22.50**

Note: Thermometers for above calorimeters, see page 380.

Calorimeter Gas Meters, Wet Test. Normal accuracy within ½ of 1%. Accuracy is dependent only upon the water level within the meter. This level is determined carefully for each meter operating under normal conditions, and is reproduced readily by reference to a convenient gauge glass equipped with a fixed meniscus marker, as adopted by American authorities. Before shipment, each meter is proven against a 1/10th cubic foot bottle, certified by the Bureau of Standards. Integrating gears are few in number to minimize resistance to rotation. Complete with thermometer and U-tube manometer.

Size	**1**	**2**	**3**	**4**
Capacity, maximum, per hour	20 cu. ft.	680 liters	50 cu. ft.	100 cu. ft.
Volume per revolution	1/10 cu. ft.	3 liters	1/4 cu. ft.	1 cu. ft.
Graduations of dial	1/1000 cu. ft.	1/100 liter	1/1000 cu. ft.	1/100 cu. ft.
Integration of small dial	100 cu. ft.	60 liters	10,000 cu. ft.	10,000 cu. ft.
66M9 Calorimeter Gas Meters. Rotor, shaft and housing of brass. **Each**	**$75.00**	**80.00**	**110.00**	*
66M10 Calorimeter Gas Meters. Rotor, shaft and housing of Monel metal. **Each**	**$90.00**	**95.00**	**150.00**	*
66M11 Calorimeter Gas Meters. Rotor, shaft and housing of stainless steel. **Each**	**$100.00**	**105.00**	**175.00**	*

*Prices upon request.

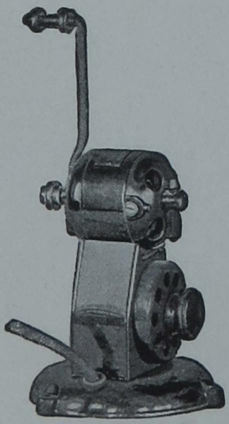


67M1

67M1 Calorimeter Gas Meter Testers. Portable one-tenth cubic foot bottle, designed to facilitate the testing of gas meters for correctness of registration, particularly the wet type of meter used in heating value determinations and experimental laboratory work. Consists of a copper displacement bottle, operated by raising or lowering the copper leveling tank, attached by a flexible tube, and is mounted on a tripod stand with adjustable shelves for raising and lowering for proper level.

The apparatus is quickly and accurately operated by raising the tank, one-tenth of a cubic foot of air accurately measured by bottle being thus displaced through the gas meter, equivalent to one turn of the meter pointer. The error in registration may then be noted directly on the meter dial and corrected by either adding or withdrawing water, depending on whether the meter is registering slow or fast. Complete with thermometer and a certificate of accuracy to one part in ten thousand, issued by the U. S. Bureau of Standards. **Each**.. **$90.00**

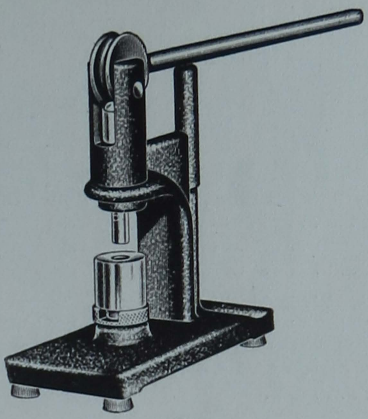
67M2 Calorimeter Gas Meter Testers. One-tenth cubic foot capacity bottle is mounted on a portable wooden stand with two adjustable shelves beside the bottle to hold a water reservoir. Bottle and reservoir are made of copper with brass fittings. An independent cock at the top line of piping is used as an air supply to the bottle after each run. Complete with thermometer and certificate of accuracy from the U. S. Bureau of Standards. **Each**......................... **$125.00**



67M3

67M3 Calorimeter Motors. For use in driving the stirrers of calorimeters and various other mechanisms. Variable speed, $^{1}/_{50}$ H. P., series wound for operation on 110 or 220 volts, A. C. or D. C., complete with electric governor, switch, countershaft, rubber belt, overarm, endless woven belt, and 5 feet of rubber-covered cord with plug for standard outlet.

Voltage	110	220
Each	**$37.50**	**39.00**



67M4

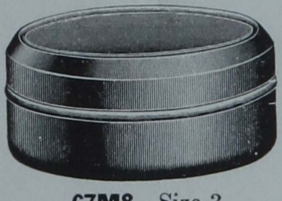
67M4 Calorimeter Pellet Presses. For making samples into pellets for calorific determinations; allows ½-inch diameter pellets to be made in any thickness from ⅛ to ½ inches. Overall dimensions are: width, 4 inches; depth, 9½ inches; height, 18½ inches. **Each**......................... **$28.00**

67M5 Calorimeter Absorption Blocks. Made of high quality paper, purified by acids. Useful to absorb difficultly combustible liquids for calorimetric work, etc. Size, 14x25 mm. In boxes containing 50 blocks. **Box**................. **$1.60**

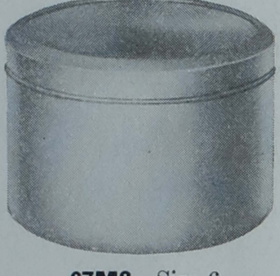
67M6 Candles, Wax Taper. ¼-inch diameter by 6 inches long. **Dozen, $ .10. Gross**...................... **$1.00**

67M7 Cans, Metal. With slip covers.

Size, pounds	**1**	**5**	**10**	**25**
Diameter, inches	$3\frac{7}{16}$	$6\frac{3}{16}$	$7\frac{7}{16}$	$9\frac{7}{8}$
Height, inches	$3\frac{11}{16}$	$5\frac{13}{16}$	$8\frac{3}{8}$	$10\frac{3}{16}$
Each	**$ .10**	**.18**	**.25**	**.40**



67M8 Size 3



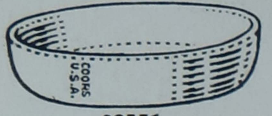
67M8 Size 6

67M8 Cans, Sample, Gill Type, Seamless. Of tin, with rounded bottoms. With covers.

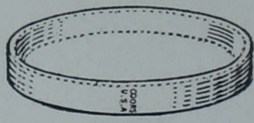
Size, ounces	**1**	**2**	**3***	**4**	**6****	**8**	**16**
Diameter, mm.	38	48	55	60	68	75	85
Height (lid on) mm.	30	34	39	45	52	56	64
Dozen	**$ .20**	**.35**	**.50**	**.65**	**.80**	**1.00**	**1.50**

*Conforms to specifications of **A. S. T. M. D-6.**

Conforms to specifications of **A. S. T. M. D-243.



68M1



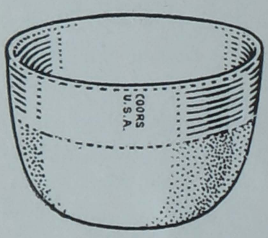
68M2

68M1 Capsules, Coors Porcelain. Rounded bottom, glazed inside and outside with exception of outside bottom surface.

Size	**1**
Diameter, rim, mm	49
Height, mm	11
Capacity, ml	10
Each	**$ .28**

68M2 Capsules, Coors Porcelain. Straight sides and flat bottom, glazed inside and outside, with exception of rim.

Size	**0**	**1**	**2**	**3**	**4**
Diameter, mm	34	45	67	69	72
Height, mm	10	12	8	13	16
Capacity, ml	6	10	18	25	40
Each	**$ .28**	**.28**	**.33**	**.40**	**.45**



68M3

68M4

68M3 Capsules, Coors Porcelain, Combustion. Rounded bottom, glazed inside and outside with exception of outside bottom surface.

Size	**2**	**3***	**3A**	**4**
Diameter, top, mm	41	45	42.5	50
Height, mm	21	25	22.5	34
Capacity, ml	16	25	22.5	40
Each	**$ .28**	**.28**	**.28**	**.40**

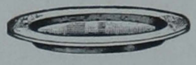
*For determination of moisture in coal and coke. **A. S. T. M. D-271.**

68M4 Capsules, Ignition, Alundum. For ignition of carbonaceous material. Cannot be used for alkali fusions. Made of a dense mixture (RA 84), having porosity of 36.9%.

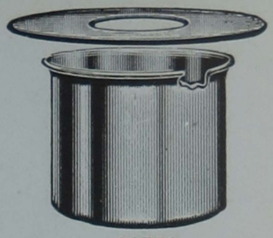
Size	**1**	**2***	**3***	**4**	**5***
Diameter, inches	$1\frac{1}{32}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{5}{8}$	$1\frac{3}{4}$
Height, inches	$\frac{7}{16}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{7}{8}$
Capacity, ml	7	10	10	18	25
Each	**$ .40**	**.40**	**.40**	**.40**	**.40**

*No. 2 has sloping sides. No. 3 has straight sides. No. 5, according to **A. S. T. M. D-271.**

For Ignition Crucibles, see page 116.



68M5



68M6

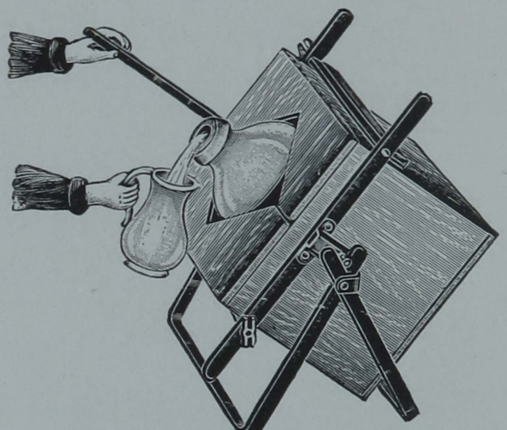
68M5 Capsule Covers, Aluminum. A. S. T. M. D-271. For alundum and porcelain capsules, in determination of ash in coal and coke. **Each** . . . . **$ .50**

68M6 Capsules, Sachs Le Docte, Sugar. Made of **Monel metal.** Diameter, $2\frac{15}{16}$ inches; depth, $2\frac{7}{8}$ inches; cover, $4\frac{3}{8}$ inches; with hole diameter, $1\frac{3}{4}$ inches. **Complete** **$2.25**

68M7 Capsules Only. Each **$1.50**

68M8 Capsule Covers Only. Each . . . . **$ .75**

68M9 Capsule Covers, Rubber Caps, Sachs Le Docte. To fit above capsules. **Each** . . . . **$ .35**

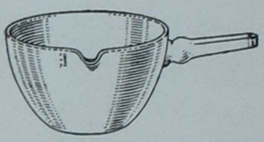


68M10

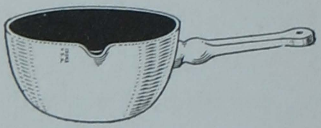
68M10 Carboy Inclinators. Strongly made of bar iron, japanned. A useful device, whereby the carrying and tilting of carboys becomes easy and their contents can be poured out with safety. Can be used on carboys from 15 inches to 21 inches. **Each** **$12.50**

68M11 Carboys. Glass bottle in wooden box shipping container. Capacity, 12 gallons. Weight, 65 pounds. **Each $5.00**

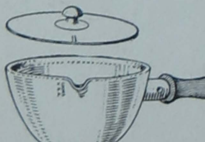
Casseroles



68M12



68M13



68M14

68M12 Casseroles, Coors Porcelain. Glazed inside and out with the exception of rim. With lip and flat porcelain handle.

Size	**00***	**0***	**1**	**2**	**3**	**3A**	**4**	**4A**	**5**	**6**	**7**	**8**
Diameter, mm	31	43	50	70	85	95	110	130	135	165	175	230
Height, mm	15	23	25	35	45	50	62	73	80	95	130	160
Capacity, ml	6	15	30	60	140	210	340	500	750	1200	1800	4000
Each	**$ .50**	**.50**	**.50**	**.55**	**.65**	**.85**	**1.05**	**1.35**	**1.75**	**2.45**	**3.85**	**12.05**

68M13 Casseroles, Coors Porcelain, Black glaze. Same as 68M12, except that the inside surface is glazed with hard black glaze for better observance of white precipitates.

Size	00*	0*	1	2	3	3A	4	4A	5	6	7	8
Each	**$1.00**	**1.00**	**1.00**	**1.10**	**1.30**	**1.70**	**2.10**	**2.70**	**3.50**	**4.90**	**7.70**	**24.10**

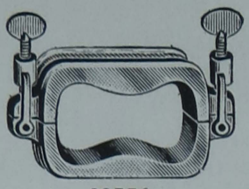
*Suitable for micro analysis.

68M14 Casseroles, Coors Porcelain. Glazed. With covers and wooden handles.

Size	**1**	**2**	**2A**	**3**	**3A**	**4**	**4A**	**5**	**6**
Diameter, mm	50	70	92	85	95	105	120	140	170
Height, mm	25	34	34	40	45	50	60	75	90
Capacity, ml	30	60	140	150	210	320	500	800	1360
Complete	**$ .83**	**.90**	**.95**	**1.00**	**1.32**	**1.65**	**2.30**	**3.00**	**4.40**
68M15 Covers Only. Each	**$ .22**	**.22**	**.22**	**.22**	**.27**	**.35**	**.50**	**.65**	**.85**

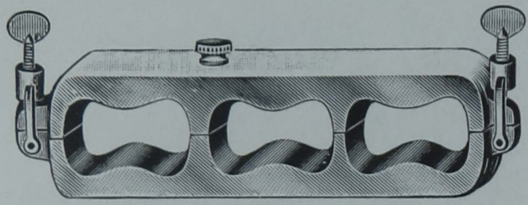
Cement, DeKhotinsky, see page 402. Cement, Sealo, see page 402.
Cement, High Temperature, see page 333.

Cement Testing Apparatus



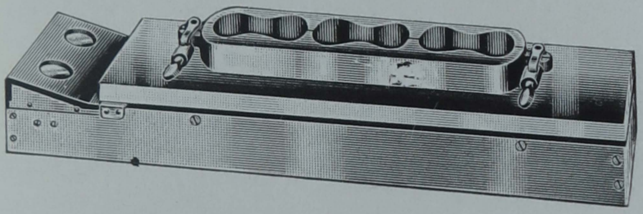
69M1

69M1 Cement Briquet Molds, Single. A. S. T. M. C-77 and C-26. Made of bronze, for making standard briquets for tensile strength tests. **Each** **$5.00**



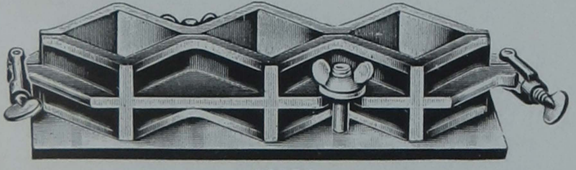
69M2

69M2 Cement Briquet Molds, Tension, Three Gang. A. S. T. M. C-77 and C-26. Forged from manganese bronze and possessed of great tensile strength and resistance to transverse stresses. Briquet contours are carefully ground and polished. The end clamps are large, strong and quick acting, with large thumb screws to facilitate clamping without the use of a twist rod. Dowel pins simplify the alignment of segments before clamping the mold. **Each** **$11.50**



69M3

69M3 Cement Mold Delimeter. A. S. T. M. C-77. Used to mold cement briquets under proper pressure. A white light flashes on under a load of 15 to 20 pounds, and a red light flashes on under pressure exceeding 20 pounds. Equipped with a glass plate, two 6-volt bulbs, transformer for 110-volt 60-cycle A. C., and connecting cord. Mold not included. Dimensions approximately 20 inches long, 5 inches wide, 3 inches deep. **Each** **$90.00**

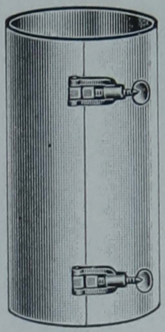


69M4

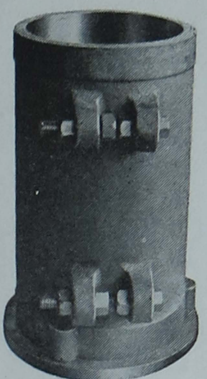
69M4 Cement Compression Cube Molds, Three Gang. A. S. T. M. C-109-T. For casting 2-inch cement cubes for use in making compression tests; made of heavy forged bronze with reinforcing ribs. End clamps are extra large and quick acting, with large thumb screws to facilitate clamping. Heavy dowel pins insure proper alignment of the mold halves. In order to obtain a water-tight seal a metal base plate, with two screw studs, is supplied. **Each** **$25.50**

69M5 Cement Compression Cube Molds. Same as 69M4, without base plate. **Each** **$21.50**

69M6 Cement Mold Tamper, Bakelite. For tamping specimens in 69M4 cube molds. Dimensions, inches, ½x1x6. **Each** **$1.00**



69M7

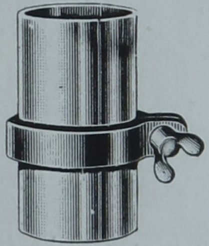


69M9

69M7 Cement Cylinder Molds. A. S. T. M. C-31. For making cylindrical concrete test specimens 6 inches in diameter by 12 inches long. Made of heavy sheet iron rolled into shape and equipped with two quick acting clamps for tight closure the full length of the parting. Wall thickness of cylinder, ⅛ inch. **Each** **$7.00**

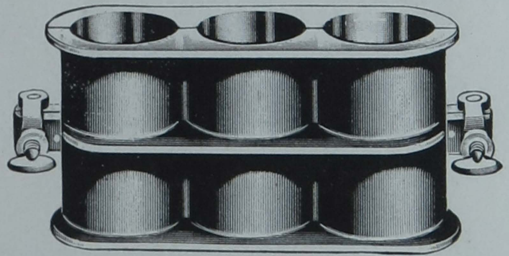
69M8 Cement Cylinder Molds. Same as 69M7, except with wall thickness of cylinder, ¼ inch. **Each** **$11.50**

69M9 Cement Cylinder Molds. A. S. T. M. C-31. For making cylindrical concrete test specimens 6 inches in diameter by 12 inches long. Made of heavy cast iron for extreme rigidity. With threaded fastening devices as shown. Fastened to circular base with three screws of which only one need be removed to release specimen. Weight about 40 lbs. **Each** **$22.00**



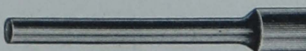
69M10

69M10 Cement Cylinder Molds. A. S. T. M. C-31. 2x4 inch cylinder of heavy brass slit along one element, with clamp tightened by a large easily gripped wing screw. **Each** **$3.75**



69M11

69M11 Cement Cylinder Molds, Three Gang. A. S. T. M. C-39. For making 2x4 inch cylinders. Constructed of heavy cast brass integrally reinforced by heavy ribs at center, top and bottom. Interiors and faces accurately machined and finely finished. Equipped with heavy quick acting yoke clamps with bolts for locking the segments together. **Each** . . **$16.50**



69M12

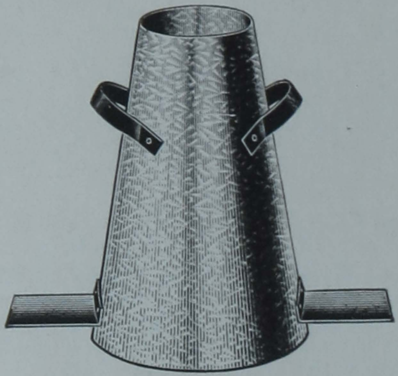
69M12 Cement Cylinder Mold Tamper. Steel. Total length, 6⅝ inches; length of head, 1 5/16 inches. Diameter of head, 1 inch. **Each** **$2.25**

Cement Mold Brushes, see 48M7 on page 48.

Cement Testing Apparatus, Continued

70M1

70M1 Cement Pat Molds. For use with steaming oven and Gilmore needle in determining the soundness and setting time of cement. The mold forms a pat ½ inch thick, 1 inch in diameter at center, tapering to a thin, flat edge 3 inches in diameter. **Each**.................................**$4.00**

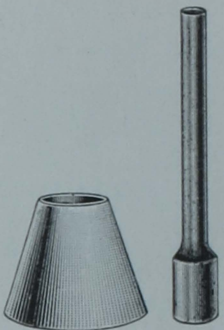


70M2

70M2 Cement Slump Test Cones. For testing consistency of Portland cement concrete, **A.S.T.M. designation D-138-T.** Made of heavy galvanized iron with strap iron handles and rigid sheet iron foot plates welded on. Base diameter, 8 inches; top diameter, 4 inches; height, 12 inches. **Each**. **$5.50**

70M3

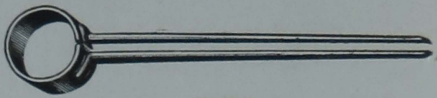
70M3 Cement Tamping Rod. Steel rod ⅞ inch in diameter; 24 inches long with bullet pointed end. Used for tamping cement in slump molds as specified in Tentative Method of Test for the Consistency of Portland Cement Concrete. **A. S. T. M. designation D-138-T.** Also used with cement measures, **A. S. T. M. C-29. Each**.....................**$2.00**



70M4

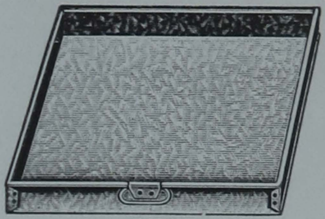
70M4 Sand Absorption Cone Test. This test method has been adopted by the American Association of State Hi-way Officials in standard method T-84 for specific gravity and absorption of fine aggregate; also tentatively by A. S. T. M. Committees C-9 and D-4, towards unifying the various society methods for determining specific gravity. The test is based on the familiar principle that moist sand containing free water can be shaped into forms by light pressure, while dry sand can not.

The sheet metal cone: Top diameter, 1½ inches; bottom diameter, 3½ inches; height, 2⅞ inches.
Set, consisting of cone and tamper...................**$3.00**



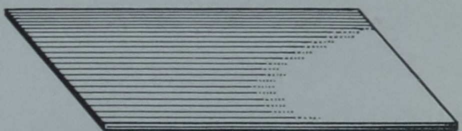
70M5

70M5 Cement Soundness Tester, Le Chatelier. For determining the soundness by measuring expansion after boiling. The apparatus consists of a split brass ring, to which are attached two parallel arms. As the cement expands, the ring spreads and the distance between the free ends of the indicating arms gives an index of the degree of soundness. **Each**...**$4.00**



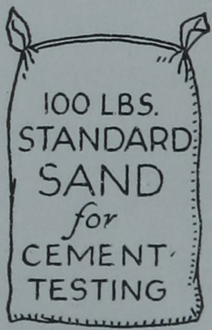
70M6

70M6 Cement Pans. Made of galvanized iron; for immersing briquettes in water until ready for testing. Size, 24x24x3 inches. **Each**.....................................**$4.00**



70M7

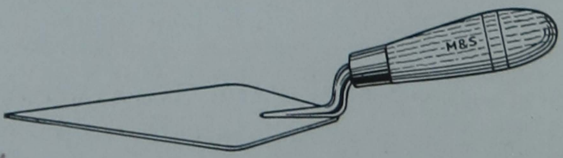
70M7 Cement Mixing Plates. Ground glass on which cement molds may be placed while being filled. Size, 18 inches square; thickness, about ⅜ inch. **Each**.............**$3.50**



70M8

70M8 Cement Sand, Ottawa Standard. Pure silica sand, 20 to 30 mesh, used in making up standard briquettes and pats in accordance with **A. S. T. M. Method C-77.** In bags of 100 pounds. **Each**..............................**$6.25**

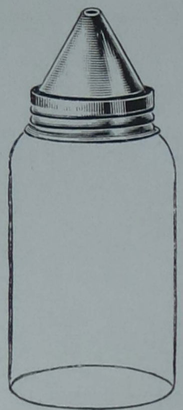
70M9 Cement Sand, Ottawa Graded. A. S. T. M. C-109T for 2-inch cubes. In bags of 100 pounds. **Each**. **$6.25**



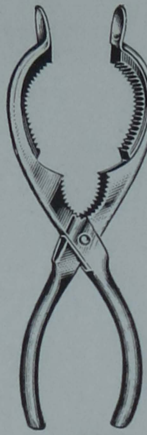
70M10

70M10 Cement Trowels. For mixing cement samples, smoothing off molds, etc. 4-inch blade. **Each**........**$ .75**

Cement Testing Apparatus, Continued



71M1

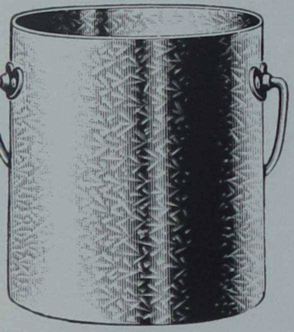


71M2

Pycnometer Top, A. A. S. H. O. Method T-15. Fits on quart and 2-quart Mason screw cap jars, for determining the specific gravity of sand and small gravel. Made of spun brass with ⅜-inch hole. The jar is first filled with the sand and weighed, then water added until completely filled, and weighed. The jar is then emptied and filled completely with water and weighed. From the results obtained, the specific gravity of the sand can be calculated.

71M1 Top Only. Without jar. **Each, $1.50 Dozen** . . **$15.00**

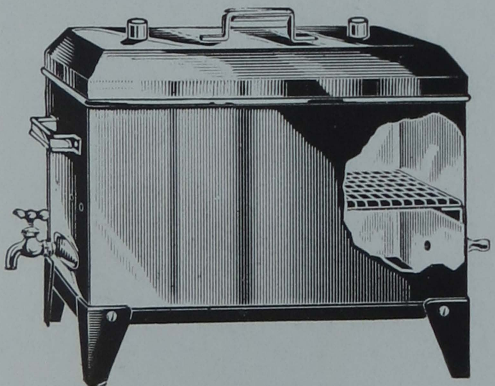
71M2 Tightening Clamp. With rubber lined jaws. **Each** . . . . **$ .50**



71M3

71M3 Cement Measures, A. S. T. M. Method C-29. For the determination of unit weight of fine, coarse or mixed aggregate for concrete. Made of heavy galvanized iron.

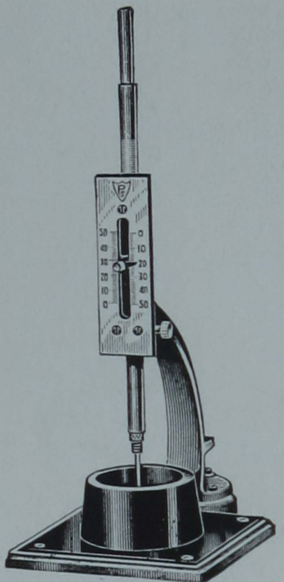
Capacity, cu. ft.	⅒	½	1
Each	**$7.50**	**15.00**	**22.50**



71M4

71M4 Cement Steaming Apparatus. Gas heated by flame from below, **A. S. T. M. Method C-77,** for soundness test. Made of copper, tinned inside, size, 15x15x30 inches. With drain cock, removable cover fitted with vents. Complete without gas burner or thermometer. **Each** **$60.00**

71M5 Same as 71M4, except **electrically heated.** Current consumption, 2500 watts. Furnished complete with 3-heat switch. When ordering specify voltage and current characteristics. **Each** **$90.00**



71M6

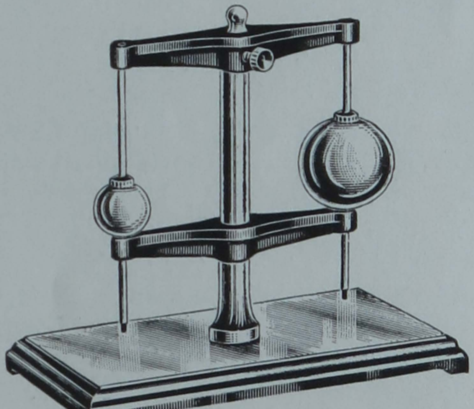
71M6 Cement Vicat Apparatus, A. S. T. M. Method C-77. For determining the normal consistency and setting time for Portland cement.

The Vicat plunger is reversible, and loaded to weigh 300 grams. It is 1 cm. in diameter for a distance of 5 cm. at one end, and has a removable needle 1 mm. in diameter and 5 cm. long screwed into the other end. The needle may be reversed and screwed into the plunger cavity for protection when not in use. A set screw locks the plunger preparatory to the test, and a pointer attached to the plunger indicates the depth of penetration. The blunt end (1cm.) is used in testing the normal consistency of neat cement. The paste shall be of normal consistency when the rod settles to a point 10 mm. below the original surface in 30 seconds after being released. The initial set shall be said to have occurred when the 1 mm. needle ceases to pass a point 5 mm. above the base plate in 30 seconds after being released; and the final set when the needle does not sink visibly into the paste.

Complete, with hard rubber mold, 1 cm. needle made of stainless steel; 1 mm. needle made of high-carbon steel. **Each** **$25.00**

71M7 Needle only (1mm. dia.) high-carbon steel for 71M6 Vicat. **Each** **$1.50**

71M8 Hard Rubber Conical Mold only. **Each** **$3.00**



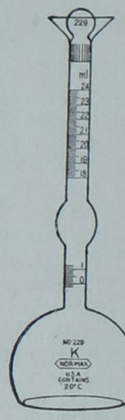
71M9

71M9 Cement Needle, Gilmore. Stainless steel, **A. S. T. M. Method C-77.** Meets requirements of the Cement Reference Laboratory; used for determining the "setting" time of cement. Consists of two stainless steel needles 1/12 and 1/24 inch in diameter with lower ends cylindrical and of uniform cross-section for a distance of 3/16 inch with ¼ pound and 1 pound weights mounted on them, respectively. The entire support is rigid, of brass, and durably finished. Furnished complete as illustrated. **Each** **$15.00**

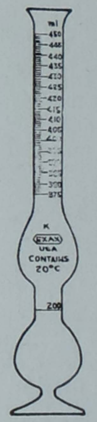
71M10 Gilmore Needle only. Stainless steel, 1/12 inch diameter with ¼ pound brass weight. **Each** **$4.50**

71M11 Gilmore Needle only. Stainless steel, 1/24 inch diameter with 1 pound brass weight. **Each** **$6.50**

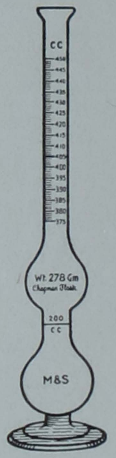
Cement Testing Apparatus, Continued



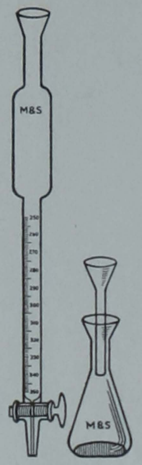
72M1



72M3



72M4



72M5

72M1 Flasks, Specific Gravity, Normax, Le Chatelier. A.S.T.M. C-128-T. Used to obtain the specific gravity of cement, sand, and other fine materials. Made in accordance with the specifications set forth by the National Bureau of Standards in Circular No. 9, "Testing of Glass Volumetric Apparatus." The graduated scale is accurate to ±0.05 ml.
Each..**$ 5.00**
Case of 6; shipping weight, 15 pounds...............**$24.00**

72M2 Flasks, Specific Gravity, N. B. S. Le Chatelier. Same as 72M1, except **tested and certified by the National Bureau of Standards.** No certificates are furnished by the Bureau with this ware as a general rule. If it complies with their requirements in accuracy and design, it is stamped with their circle within which appear the letters U. S. and the year of the test. To cover the cost of shipping to the Bureau, cost of test and other necessary expenses, a charge of **$3.00 net** is made above the price of 72M1.

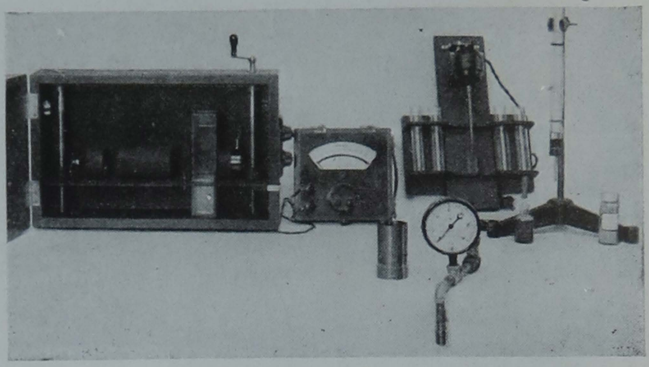
72M3 Flasks, Specific Gravity, Exax Blue Line, Chapman. A. S. T. M. C-128-T, C-69 and C-70. It contains 200 ml. in the lower bulb and 175 ml. in the upper bulb. The stem is graduated to 450 ml. in 1 ml. **Each**..............**$ 5.00**
Case of 6; shipping weight, 30 pounds...............**$24.00**

72M4 Flasks, Specific Gravity, Chapman. For determination of specific gravity, surface moisture, and percentage of voids of fine aggregates. The volume of the lower bulb up to a mark on the constricted neck is exactly 200 ml., while the combined volume of the two bulbs up to the lowest graduation on the upper tube is 375 ml. The graduations on the upper tube are from 375 ml. to 450 ml. The net weight (tare) of each flask is etched on the upper bulb. Furnished with a metal base, a cleaner for the upper tube of the flask, diagrams for interpreting results and instruction booklet. **Each**........**$10.00**

72M5 Specific Gravity Apparatus, Jackson. A. S. T. M. C-128-T. For determining the apparent specific gravity of sand, stone and slag screening and other fine non-bituminous highway materials. Consists of a burette graduated 0.02 specific gravity, inside diameter, 7 mm., length, 28 cm. Calibrated to indicate the specific gravity directly when a 50-gram sample is placed in the flask which is graduated at 200 ml. Has a hollow ground-in glass stopper.
Complete with burette and flask. **Each**..............**$6.00**

72M6 Burette, Only. For 72M5 apparatus. **Each**....**$3.50**

72M7 Flask, Only. For 72M5. **Each**..............**$2.50**

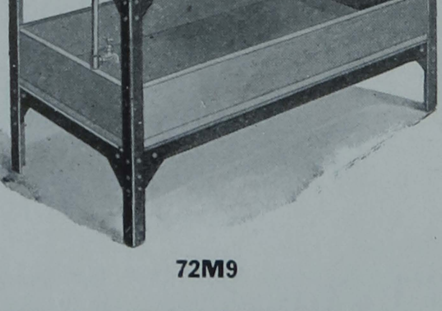


72M8

72M8 Wagner Turbidimeters. Developed by the Cement Reference Laboratory at the National Bureau of Standards. Originally designed for determining the specific surface of Portland cement, but it is being rapidly adapted to other materials. It is an apparatus for measuring the light that passes through a suspension of pulverized material dispersed in a suitable medium. A suspension of material is made and placed in the path of a beam of light of constant intensity. The light that passes through the suspension falls on a photoelectric cell which generates an electric current. Current generated is measured by a micro-ammeter. The readings of the meter afford a measure of the turbidity of the suspension from which the surface area of the suspended particle is calculated. Particle-size distribution is obtained by observing changes in turbidity as the particles settle from suspension.

The application of the modern photoelectric cell and highly sensitive micro-ammeter to the measurement of turbidity has made possible a degree of precision heretofore unattainable.

Outfit furnished complete with calibrated flask to hold 335 ml. of liquid, which is the amount required to make up a suspension, a stirring device mounted on a test tube rack with 110-volt Universal motor, timing burette graduated in accordance with A. S. T. M. Tentative Standard C-115-T, settling tank, spraying device, sieve, micro-ammeter.
Outfit complete, except storage battery. **Each**....**$245.00**

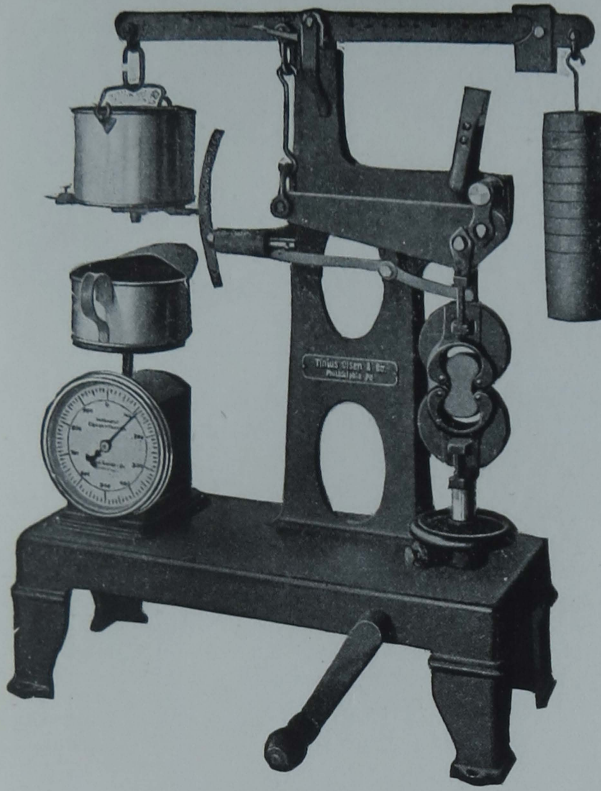

TINIUS OLSEN
TESTING MACHINE CO.
PHILA. PA. U.S.A.

72M9

72M9 Soapstone Immersion Tanks. For cement, concrete or road materials testing laboratories.

Tank consists of three sections of soapstone, mounted one over the other, all in a structural steel frame. The sections are provided with piping for running water, overflow and drain. Length, 6¼ feet; width, 3¼ feet; height, 6 feet; weight, 2,000 pounds. **Each**..................................**$500.00**

Cement Testing Apparatus, Continued



73M1

73M1 Cement Briquet Testing Machines. Olsen's Automatic Shot Type. For testing the tensile strength of cement briquets. Well designed, accurate, sturdy and quickly and easily operated. The load at any instant as well as the maximum breaking stress is indicated on the scale placed on the base, or may be weighed on the beam on models fitted with beam scale and poise.

In operating the machine the bucket is filled sufficiently with shot to balance, as indicated by the pointer. Specimen is then placed in the clips and initial load, which may be set at a predetermined amount, usually 50 lbs., is taken up with the hand wheel. The wheel is provided with a click to prevent a premature break due to excessive initial load. Trip lever is then set and the shot released, regulating the flow, or rate of loading, by adjustment of the slide valve. At rupture of the briquet the flow of shot is instantly cut off.

The machines numbers 1 and 2 are built with hand-crank only, while 3 is not equipped with either scale beam or hand crank and can be secured in the 1,000-pound capacity machine only. Numbers 4 and 5 are equipped with both hand crank and scale beam and allow a dual weighing system. Scale beam reads by 1-pound marks to 100 pounds and by end weights to 1,000 pounds. In case of a 2,000-pound capacity machine, the value of the marks is double the above readings.

Machines are equipped with A. S. T. M. standard roller clips and supply of shot. At extra cost compression and transverse test tools may be obtained for use in testing coke, clay and glass.

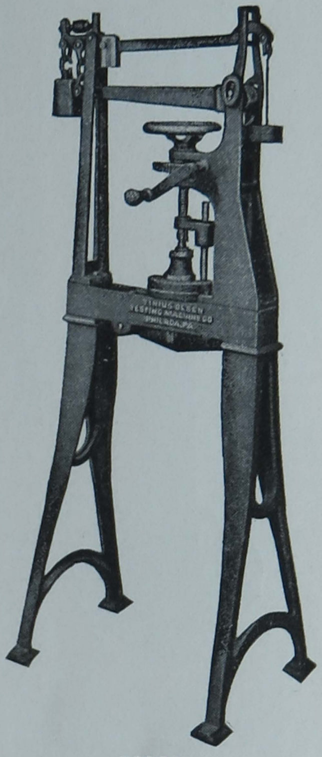
Size	1	2	3	4	5
Capacity, pounds	1000	2000	1000	1000	2000
Length, inches	24	40	24	24	40
Width, inches	10	11	10	10	11
Height, inches	36	36	30	30	36
Weight, pounds	155	170	150	155	170
Each	**$325.00**	**425.00**	**300.00**	**350.00**	**450.00**

73M2 Standard Cement Briquet Formers, Olsen's.

Designed especially for forming the cementation briquets, as used in the cementation impact tester illustrated on page 74.

It is self-contained and arranged so the mold with subpress can be put in the machine as one piece when applying the pressure. The use of the sub-press enables the operator to fill the mold better and quicker and is a very valuable feature of the machine. Machine is ideal for any small compression tests within its capacity.

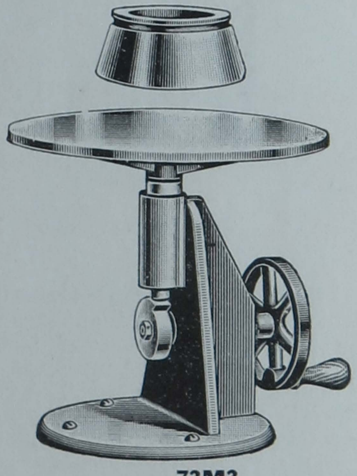
In using the machine, the sub-press and mold are taken to the work table, where the mold is filled and the plunger inserted, after which the subpress is placed in the machine, and the required pressure applied. The pressure is then released and by means of a release block the briquet is forced out of the mold. This machine is recommended for forming cementation briquets or for making general small compression tests.



73M2

Length, inches	30
Breadth, inches	19
Height, inches	66
Weight, pounds	300
Each	**$350.00**

Cement Flow Tables. A. S. T. M. C-39, C-87 and C-91-T. For measuring the consistency of concrete by placing a sample, molded in the shape of a truncated cone, on the table, and by turning the crank, the table is raised and dropped a specified distance. The "spread" of the base of the cone expressed as a percentage of its original bottom diameter is the "flow." The plate is cast bronze, mounted in a heavy cast iron frame, with the operating wheel actuating a cam to produce the required drop.



73M3

73M3 Flow Tables. A. S. T. M. C-87 and C-91-T. With 10 inch diameter plate and cam arrangement for either ⅛-inch or ½-inch drop, respectively. Includes a heavy brass mold 4 inches inside diameter at the base, 2¾ inches inside diameter at the top, and 2 inches high.

Each **$55.00**

73M4 Flow Tables. A. S. T. M. C-39. With 30 inch diameter plate and cam motion to produce a ½-inch drop. Includes a galvanized iron mold 6¾ inches inside diameter at the top, 10 inches inside diameter at the bottom, and 5 inches high. **Each** **$175.00**

Cement Testing Apparatus, Continued

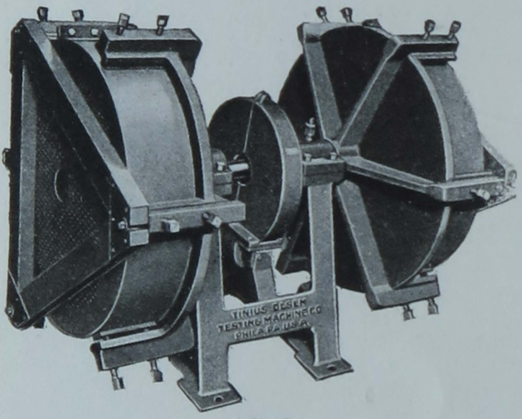
74M1

74M1 Cement Impact Testing Machines. Olsen's U. S. Standard. Self-contained and on a self-supporting base, thus forming a more desirable type of machine than the bench machine. It is also unique in being arranged for tests of long duration, as the recording drum has a vertical motion as it rotates, thereby taking the record of the test in the form of a spiral curve of considerable length. This latter feature is of considerable value in determinations of high cementation value, where one turn of the recording drum would not be sufficient to record the entire test.

The specimen used is a cylinder 25 mm. in diameter by 25 mm. high which is placed on the anvil and held in place by a plunger and a pair of springs. With the specimen in place, the machine is set in operation and the hammer, one kilogram in weight, is allowed to fall repeatedly on it through a height of one cm. until the specimen breaks down. As each blow is imparted to the specimen, a stroke is made on the rotating drum.

A prepared silicated paper should be used in connection with a brass point for the best results.

The machine is arranged to deliver about 60 blows per minute, and has a direct connected motor drive, with the gearing all encased and the motor mounted directly on the frame. Length, 18 inches; width, 9 inches; height, 48 inches; weight, 90 pounds. **Each**.............................. **$375.00**



74M2

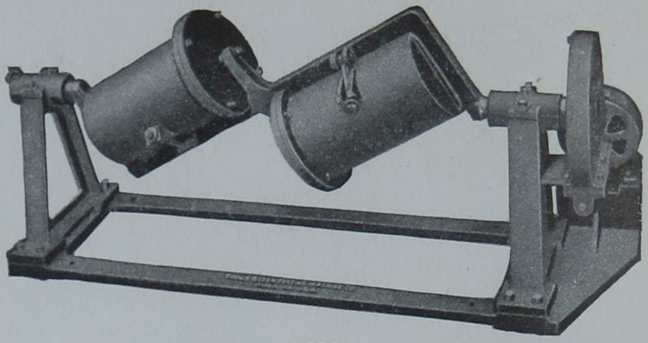
74M2 Talbot-Jones Rattlers. For wear tests on concrete blocks. This machine makes an abrasion resistance test on concrete specimens 8x8x5 inches, using 10 blocks in each rotating unit of the machine. Machines are built in either double or single gang. The two-unit machine is illustrated.

The ten test blocks are secured inside the outer shell and rotated at 30 R. P. M. Abrasion is through tumbling cast iron shot. Standard charge is 133-1⅞ inches diameter and 10-3¾ inches diameter balls, and is furnished as additional equipment when desired. 3600 revolutions are required for each test, the necessary counter being provided. The percentage loss of weight by the test specimens provides an accurate and conclusive index of the wearing quality of the concrete under actual service conditions. Comparative tests of different mixtures, cements and aggregates, or of different surface finishes can be made; or blocks may be cut from finished work for test.

Machine is of sturdy design. Motor drive is direct, through encased worm reduction gear, running in oil. Belt drive on request. Steel, two gang block mold, extra upon request.

Length, 5 feet; width, 4 feet; height, 4 feet; weight, pounds, 2,250. **Each**.................................... **1250.00**

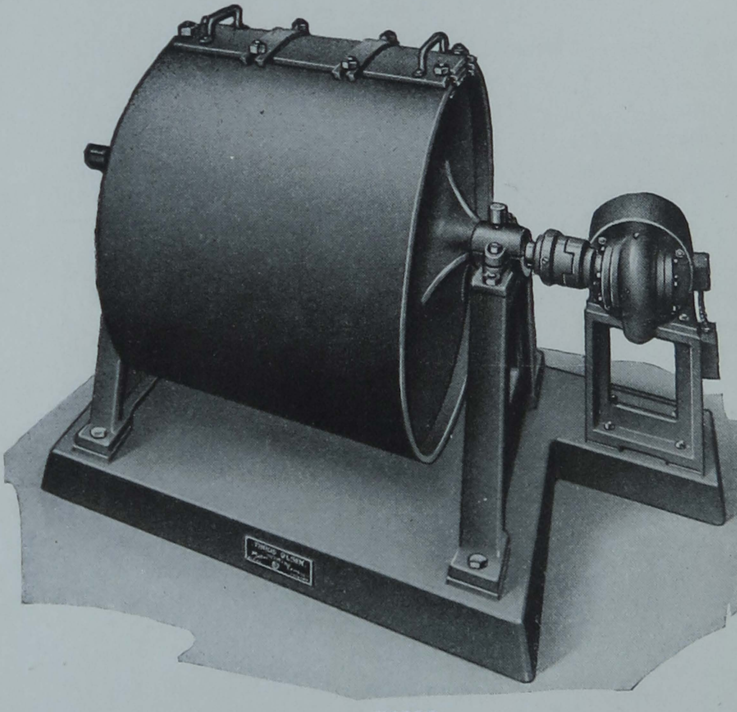
74M3 Standard Charge. Consists of 133-1⅞ inches diameter and 10-3¾ inches diameter balls. **Each**...... **$85.00**



74M4

74M4 Abrasive Cylinders, Olsen. A. S. T. M. D-2. These machines are self-contained and rugged in design with the cylinders mounted as two, three, or four gang. The cylinders are 20 centimeters in diameter by 34 centimeters long, mounted at 30° from the center line of rotation of the steel shaft. The shaft is provided with a revolution counter. Regularly furnished with motor drive through fully enclosed worm gear. Belt drive with tight and loose pulley on request.

Number of cylinders in gang	**2**	**3**	**4**
Length, feet	6⅓	8⅓	10⅔
Breadth, inches	30	30	30
Height, inches	28	28	28
Weight, pounds	630	710	830
Each	**$375.00**	**475.00**	**600.00**



74M5

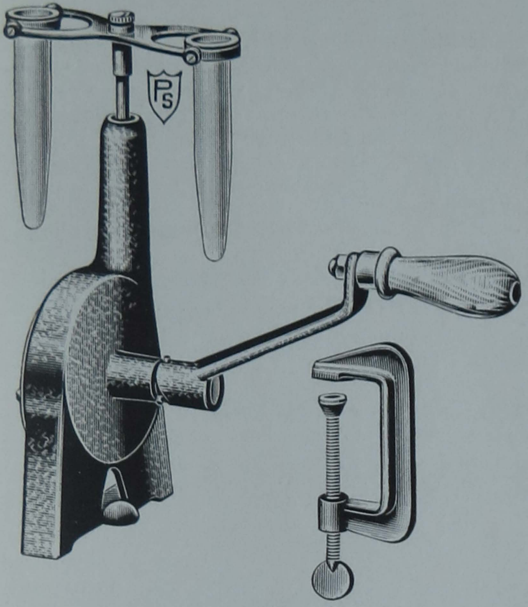
74M5 Abrasion Machines, Los Angeles Type. Meets the A. S. T. M. requirements for the Los Angeles Abrasion Test for coarse aggregates.

The cylinder is made of ½-inch boiler plate 28 inches in diameter by 20 inches long inside. With cast steel heads and welded seams throughout. A longitudinal baffle or shelf of wear-resisting steel is bolted to the knee pieces, which are riveted to the cover plate or drum as desired. The cover plate permits easy removal of the baffle for purposes of renewal or to reverse it when worn on one face.

Direct connected with ½ H. P. motor through a worm reduction gear rotating the barrel at 30 to 35 R. P. M.

Length, 4 ft., 5 in.; width, 3 ft., 4 in.; height, 3 ft., 3 in.; weight, 1,300 pounds. **Each**...................... **$450.00**

Centrifuges



75M1

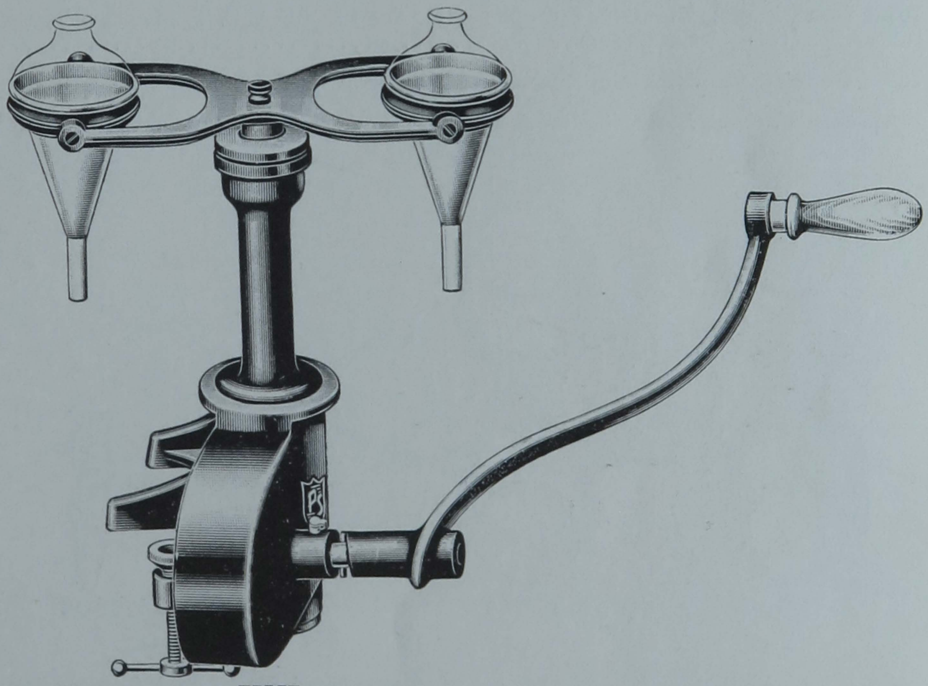
Centrifuges, Hand, Junior Model. Driving gear is cast iron; worm is steel. Gears and bearings are completely sealed in housing. Crank is steel and of the release clutch type. Disengages the driving shaft instantly when released by the operator. This reduces wear on the gears by eliminating handle-drag; permits a gradual rather than a sudden slowing down of the whirling tubes; does away with vibration to a marked extent and prevents agitation of sediment. Vertical shaft runs in a friction-free bronze bushing, with thrust-load ball-bearing at lower end of worm spindle. Separate screw clamp is included for fastening to table tops up to 1½ inches thick. Gear ratio is 15 to 1. Driving speed of 120 revolutions per minute is equivalent to a centrifugal speed of 1800 R.P.M. Diameter of swing (tip to tip of 15 ml. whirling tubes) is 12¾ inches. Turning radius of handle is 3 inches. Total height is 10 inches.

75M1 Centrifuges, Hand, Junior Model. 2-place head and aluminum shields. For 15 ml. tubes. Glass tubes included, one plain and one graduated. **Each**.......... **$14.00**

75M2 Centrifuges, Hand, Junior Model. 4-place head and aluminum shields. For 15 ml. tubes. Glass tubes included, two plain and two graduated. **Each**.......... **$16.00**

Centrifuges, Hand, Senior Model. A. S. T. M. D-96. Driving gear is of cast iron; worm is steel. A Timken tapered roller bearing is at both top and bottom, with a precision ball bearing at the center to prevent deflection even at high speeds under heavy loads. Gears and bearings are completely sealed into housing, dust and grease tight, equipped with clamps for rigid fastening to table tops up to 1⅝ inches thick. Long crank of steel with hard wood handle is of release clutch type. Oil holes and cups are located at vital points. Gear ratio is 25 to 1. Driving speed of 60 R.P.M. gives a centrifugal speed of 1500 R.P.M. Diameter of swing (tip to tip of 100 ml. whirling A. S. T. M. tubes) is 16½ inches. Turning radius of handle, 9 inches. Total height of centrifuge, 13 inches. Gear ratio figures are cast on the gear housing for convenient reference when running tests at specific centrifugal speeds. Furnished without dome.

75M3 Centrifuges, Hand, Senior Model. 2-place head and aluminum shields. For 50 ml. tubes. Glass tubes included, one plain and one graduated. **Each**.......... **$29.50**



75M7

75M4 Centrifuges, Hand, Senior Model. 4-place head and aluminum shields. For 50 ml. tubes. Glass tubes included, two plain and two graduated. **Each**.......... **$34.25**

75M5 Centrifuges, Hand, Senior Model. A. S. T. M. D-96. 2-place head and aluminum shields. For A. S. T. M. cone-shaped centrifuge tubes. Glass tubes not included. **Each**.......... **$31.50**

75M6 Centrifuges, Hand, Senior Model. A. S. T. M. D-96. 4-place head and aluminum shields. For A. S. T. M. cone-shaped centrifuge tubes. Glass tubes not included. **Each**.......... **$36.50**

75M7 Centrifuges, Hand, Senior Model. A. S. T. M. D-96. 2-place head and aluminum shields. For 100 ml. A. S. T. M. pear-shaped centrifuge tubes or 100 ml. Goetz form "phosphorus in steel" tubes. Glass tubes not included. **Each**.......... **$31.50**

75M8 Centrifuges, Hand, Senior Model. A. S. T. M. D-96. 4-place head and aluminum shields. For 100 ml. A. S. T. M. pear-shaped centrifuge tubes or 100 ml. Goetz form "phosphorus in steel" tubes. Glass tubes not included. **Each**.......... **$36.50**

Centrifuge Domes. May be attached to centrifuges by means of flange on gear housing. Increase centrifugal speed up to 50% and reduce driving effort required at a given speed.

75M9 Centrifuge Domes. For hand centrifuges 75M3, 75M4, 75M7 and 75M8. **Each**.......... **$12.50**

75M10 Centrifuge Domes. For hand centrifuges 75M5 and 75M6. **Each**.......... **$15.00**

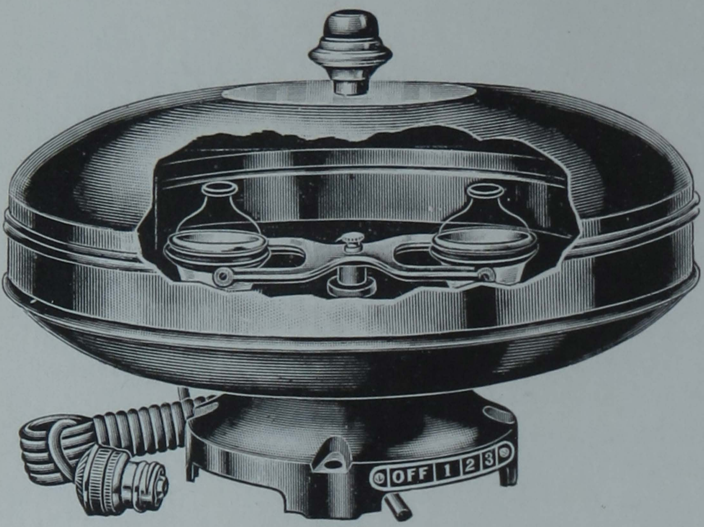
75M11 Centrifuge Domes. For electric centrifuges 76M1, 76M2, and 76M3*. Made of heavy steel, with tight fitting cover, diameter, 14½ inches. **Each**.......... **$10.00**

75M12 Centrifuge Domes. For electric centrifuges 76M4, 76M5 and 76M6.* **Each**.......... **$12.50**

75M13 Centrifuge Domes. For electric centrifuges 76M7 and 76M8 * **Each**.......... **$15.00**

*Electric Centrifuges shown on page 76.

Centrifuges, Continued



76M5

Centrifuges, Electric. Equipped with powerful motor especially selected for centrifuge work. Grease-sealed ball-bearings, lubricated at the factory, are conducive to quiet running and are free from vibration. The initial lubrication charge will suffice during the life of the bearing. A built-in rheostat control with "off" position, gives speeds of 900, 1200, or 1800 R.P.M. without using a dome. But if dome is used, the operating speeds increase about 50%. Motor will operate on 110 volts only, A. C. or D. C. **Furnished without dome.** For domes, see page 75.

76M1 Centrifuges, Electric, 2-place head. For 15 ml. tubes. Complete with tubes. **Each**........................**$36.50**

76M2 Centrifuges, Electric, 4-place head. For 15 ml. tubes. Complete with tubes. **Each**........................**$40.00**

76M3 Centrifuges, Electric, 2-place head. For 50 ml. tubes. Complete with tubes. **Each**........................**$38.00**

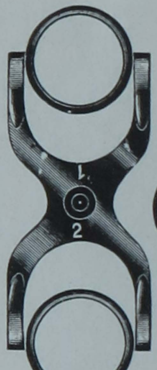
76M4 Centrifuges, Electric, 4-place head. For 50 ml. tubes. Complete with tubes. **Each**........................**$55.00**

76M5 Centrifuges, Electric, 2-place head. For 100 ml. A. S. T. M. pear-shaped tubes or 100 ml. Goetz form "phosphorus-in-steel" tubes. Less tubes. **Each**........................**$55.00**

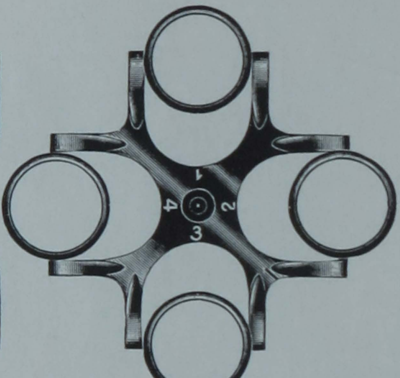
76M6 Centrifuges, Electric, 4-place head. For 100 ml. A. S. T. M. pear-shaped tubes or 100 ml. Goetz "phosphorus-in-steel" tubes. Less tubes. **Each**........................**$60.00**

76M7 Centrifuges, Electric, 2-place head. For A. S. T. M. cone-shaped tubes. Less tubes. **Each**..................**$55.00**

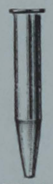
76M8 Centrifuges, Electric, 4-place head. For A. S. T. M. cone-shaped tubes. Less tubes. **Each**..................**$60.00**



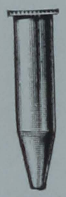
76M9



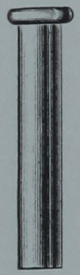
76M10



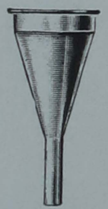
76M17



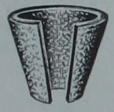
76M18



76M19



76M20



76M21

Centrifuge Parts and Accessories

Standard Heads. Black japan baked-on finish, carefully balanced. With free swinging trunnion rings. Heads for 15 and 50 ml. tubes are cast brass; heads for 100 ml. tubes are malleable iron with steel trunnion rings.

76M9 2-Place Head. For 15 ml. tubes. **Each**........................**$2.00**

76M10 4-Place Head. For 15 ml. tubes. **Each**........................**$4.00**

76M11 2-Place Head. For 50 ml. tubes. **Each**........................**$3.35**

76M12 4-Place Head. For 50 ml. tubes. **Each**........................**$5.35**

76M13 2-Place Head. For 100 ml. A. S. T. M. pear-shaped oil tubes, or Goetz form "phosphorus-in steel" tubes. Fits Senior model and electric centrifuges only. **Each**........................**$3.75**

76M14 4-Place Head. Otherwise, same as 76M13. **Each**........................**$6.00**

76M15 2-Place Head. For A. S. T. M. cone-shaped oil tubes. Fits Senior and electric model centrifuges only. **Each**.....**$3.75**

76M16 4-Place Head. Otherwise, same as 76M15. **Each**........................**$6.00**

76M17 Shields, Aluminum. For 15 ml. tubes. **Each**.**$ .25**

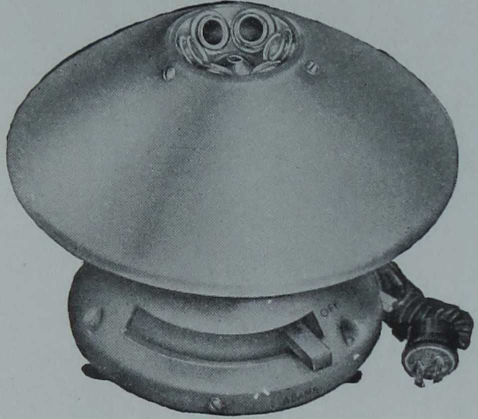
76M18 Shields, Aluminum. For 50 ml. tubes. **Each**.**$ .35**

76M19 Shields, Aluminum. For A. S. T. M. cone-shaped oil tubes. **Each**........................**$1.35**

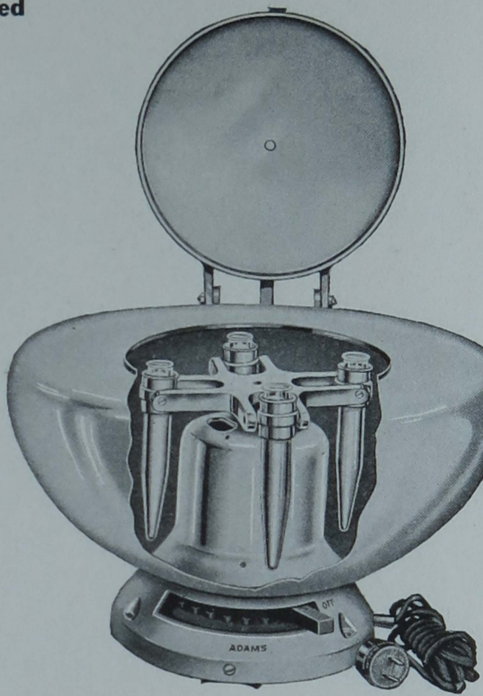
76M20 Shields, Aluminum. Cork lined. For 100 ml. A. S. T. M. pear-shaped oil tubes or Goetz form "phosphorus-in-steel" tubes. **Each**........................**$1.35**

76M21 Cork Insert Only. For 76M20. **Each**........**$ .15**

Centrifuges, Continued



77M1



77M2

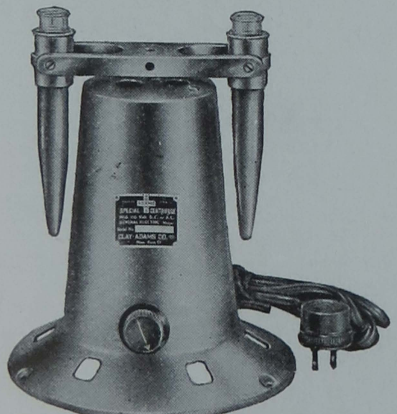
77M1 Centrifuges, Electric, Safety Head. Substantially built with suspended Universal motor, well ventilated, fan cooled, for A. C. and D. C. 110 volts. Contains a five-speed built-in rheostat, combination start, stop, and speed control lever. Will give a speed up to 4000 R. P. M. depending on the type of equipment used. Draws 132 watts, 1.48 amperes on full load. Furnished with 10 feet of cord and plug attachment. Equipped with conical head (55° angle) made of polished cast aluminum. Easy to clean and will not stain. Embodies the sloping sedimentation principle, which, together with increased speed, gives unusually quick separation. Head is machined to take six standard 15 ml. shields and tubes and acts as a fly-wheel to give smooth, quiet operation with minimum vibration. Diameter, including safety head, is 10 inches. Net weight, 10½ pounds. Shipping weight, 16 pounds. Complete with six aluminum shields and three each graduated and ungraduated 15 ml. glass tubes. **Each**......**$48.00**

77M2 Centrifuges, Electric. Same as 77M1 centrifuge, except equipped with 4-place head, four aluminum shields, and two each graduated and ungraduated 15 ml. glass tubes. Without guard bowl. **Each**........................**$37.50**

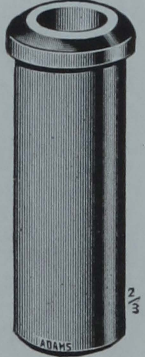
77M3 Centrifuges, Electric. Same as 77M1 centrifuge, except equipped with 2-place head, two aluminum shields, and one each graduated and ungraduated 15 ml. glass tubes. Without guard bowl. **Each**.....................**$33.00**

77M4 Centrifuges, Electric. Same as 77M1 centrifuge except equipped with 2-place head, two aluminum shields, and one each graduated and ungraduated 50 ml. glass tubes. Without guard bowl. **Each**........................**$39.50**

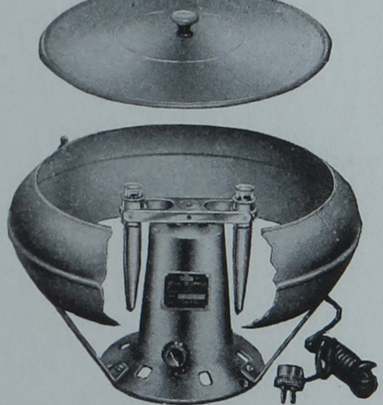
77M5 Guard Bowls, Hinged Cover. Made of spun steel and easily attached to 77M1 centrifuge base by screws and adapters. Increases the speed and makes for greater safety. **Each**.....................................**$13.50**



77M6



77M8



77M7

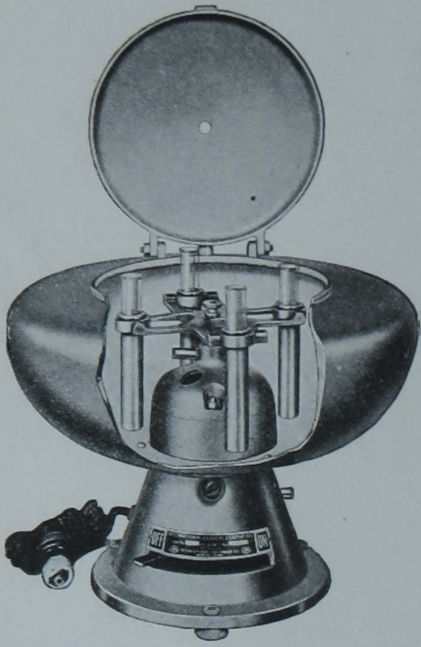
77M6 Centrifuges, Electric, Small. Efficient, economical, compact and practical. Has a speed of 2000 R. P. M. Furnished with Universal fan cooled motor for A. C. or D. C. 110 volts. Has a built-in rheostat; stops, starts and supplies all speeds on one control. Base is 6½ inches and can be attached to laboratory table if desired. Suction cups on base prevent creeping. Supplied with ten feet of cord and attachment plug. Draws 57 watts—0.55 amperes. Complete with 2-place head, two aluminum shields, and one each graduated and ungraduated 15 ml. tubes. **Each**......................................**$22.50**

77M7 Centrifuges, Electric, Small. Same as 77M6, except equipped with protective guard bowl which increases speed and makes for greater safety. **Each**...**$31.50**

77M8 Metal Shields, Cylindrical. For use with 100x13 mm. (4x½ inches) culture or test tubes, or with 5 ml. tapered centrifuge tubes. For any of above centrifuges. **Each**....**$ .60**

77M9 Metal Shields, Cylindrical. For use with 1 and 2 ml. tapered centrifuge tubes. For any of above centrifuges. **Each**.......................................**$ .55**

Centrifuges, Continued



78M1

Centrifuges, Electric, International, Clinical. Maximum speeds varying from 2000 R. P. M. to 3400 R. P. M. Will operate on any lighting circuit, either A. C. or D. C. Speed control rheostat, with 7 steps and off point for stopping, mounted in base.

Supplied with 6 feet of flexible cord and attachment plug. Three flexible rubber feet give stability and perfect cushioning without the necessity of securing to table or bench. Attractively finished in aluminum lacquer outside and white lacquer inside. Listed by the Underwriters' Laboratories. Height, cover closed, 12 inches; diameter of guard bowl, 13½ inches; diameter of base, 8 inches. Shipping weight, 30 pounds. Net weight, 23 pounds.

78M1 Centrifuges, Electric, International, Clinical. Without head or accessories. **Each** **$42.75**

78M2 Centrifuges, Electric, International, Clinical. With 4-tube, 15 ml. head and attached trunnion rings, No. 213, 4 Cornell style 15 ml. metal tubes, No. 303, and rubber cushions, No. 570. For 110 volts, A. C. or D. C. Complete, but without glass tubes. **Each** **$55.00**

78M3 Centrifuges, Electric, International, Clinical. With 2-tube, 15 ml. head and attached trunnion rings. No. 214, 2 Cornell style 15 ml. metal tubes, No. 303, and rubber cushions, No. 570. For 110 volts, A. C. or D. C. Complete, but without glass tubes. **Each** **$53.00**

78M4 Centrifuges, Electric, International, Clinical. With 4-tube combination head, No. 211, having 2 attached trunnion rings, with 2 Cornell style 15 ml. metal tubes, No. 303, and rubber cushions, No. 570, 2 detachable trunnion rings, No. 325, with 2 Cornell style, 50 ml. metal tubes, No. 320, and rubber cushions, No. 571. For 110 volts, A. C. or D. C. Complete, but without glass tubes. **Each** **$60.00**

78M5 Centrifuges, Electric, International, Clinical. With 4-tube 50 ml. head, No. 215, 4 Cornell style 50 ml. metal tubes, No. 320, rubber cushions, No. 571, and 4 detachable trunnion rings, No. 325. For 110 volts, A. C. or D. C. Complete, but without glass tubes. **Each** **$65.00**

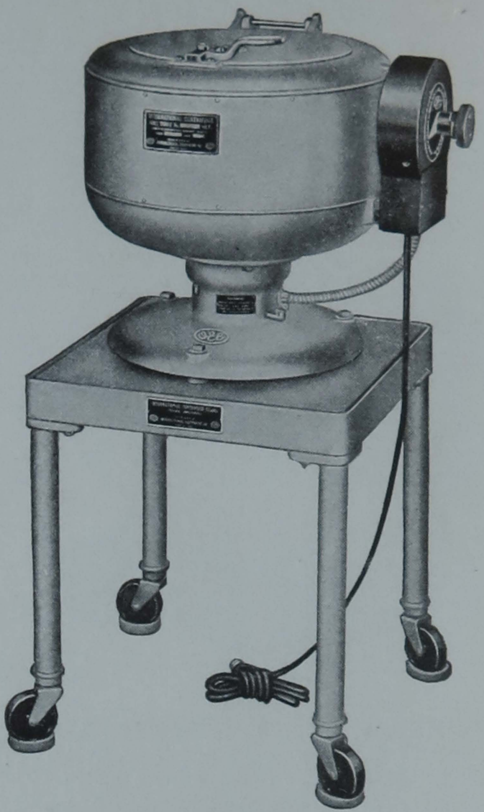
78M8

Conical Heads For International Clinical Centrifuges. Embody the sloping sedimentation principle with tubes held in the head at a fixed angle to the vertical axis of rotation. Made from a magnesium alloy for strength and lightness, machined all over and highly polished to reduce air friction, the conical head permits greatly increased speeds over regular equipment. The head is secured to the shaft by means of a positive locking, taper sleeve adapter made of stainless steel to prevent corrosion.

78M6 4-Place Head, 15 ml. Takes four Cornell style 15 ml. metal tubes, No. 303. Without tubes. **Each** **$20.00**

78M7 4-Place Head, 50 ml. Takes four Cornell style 50 ml. metal tubes, No. 320. Without tubes. **Each** **$20.00**

78M8 4-Place Combination Head, 15 ml. and 50 ml. Takes two 15 ml. No. 303 and two 50 ml. No. 320 Cornell style metal tubes. Without tubes. **Each** **$20.00**



78M9

78M9 Centrifuge, Electric, International, Size 1, Type C. Of improved design and construction. Suitable for routine laboratory work, and for all ordinary applications of a heavy duty centrifuge where very high speed is not essential. Has maximum speeds varying between 1800 R. P. M. and 3300 R. P. M. with corresponding maximum relative centrifugal forces (R. C. F.) varying between 500 x gravity and 1700 x gravity, depending on the type of equipment used.

The electric motor is built for the standard 110 and 220 voltages. Either motor, including the rheostat, may be used interchangeably on A. C. and D. C., but is not interchangeable as to voltage. Base forms the frame for the motor and all electrical connections are enclosed. Top and bottom of guard are castings with a heavy rolled steel band between, insuring ample protection.

Type E, circular, self-enclosed rheostat of dial movement with 20 steps of speed control is attached to the centrifuge so as to make the machine self-contained. Supplied with an 8-foot connection cord and plug cap ready to plug into a wall receptacle, thus eliminating any electric installation. Not equipped with hand brake or brush release.

Dimensions: Diameter of guard, 18 inches; total width, 22 inches; height, 19 inches. Weight, pounds: Net, 100; shipping, 170. Dimensions of packing case: 22x24x32 inches. Finished on the outside with aluminum bronze lacquer and on the inside with white enamel paint. Complete with rheostat and cord, but without head, tubes, and stand. For 110 volts A. C. or D. C. **Each** **$135.00**

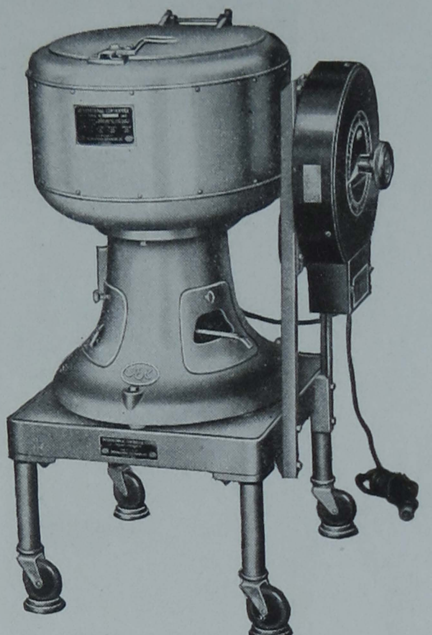
78M10 Centrifuge, Electric, International, Size 1, Type C. Same as 78M9, except for 220 volts, A. C. or D. C. **Each** **$137.00**

78M11 Stand, Portable, Vibrationless. For 78M9 and 78M10 centrifuges. Made of iron and steel, neatly finished in aluminum paint to harmonize with centrifuge. Mounted on four ball bearing casters with Bakelite composition wheels. Brings top of centrifuge to the convenient height of 39 inches; easily movable. Equipped with three sets of rubber cushions and rubber floor sockets for locating the casters. No electric installation required as cord is furnished with the centrifuge.

Weight, pounds: Net, 50; shipping, 80. Packing case: 22x22x10 inches. **Each** **$30.00**

Note: Accessories on following pages.

Centrifuges, Continued



79M1

Centrifuges, Electric, International, Size 1, Type SB. Suitable for routine and research work in bacteriological, physiological and chemical laboratories. Has maximum speeds varying between 2000 R. P. M. and 5000 R. P. M. with corresponding maximum relative centrifugal forces (R. C. F.) varying between 500 x gravity and 4000 x gravity, depending on the type of equipment used. Mounted on heavy base casting which is provided with holes for bolting to foundation or portable stand. Equipped with a hand brake for rapid stopping and a brush release arrangement for allowing the centrifuge to come to rest more slowly. Removable hand hole plates cover openings in side of base casting to prevent contact with live parts of motor.

Type SB electric motor, mounted in rubber so as to make it self-balancing, within reasonable limits. For standard 110 and 220 voltages. The 110 volt motor, including the rheostat, may be used interchangeably on A. C. or D. C. provided the connections at the centrifuge and rheostat terminals are correspondingly changed. The 220 volt motors are wound and connected differently for A. C. and D. C. and are not interchangeable.

Type QV rheostat is self-enclosed; has dial movement with 50 steps of speed control. Integral with it is a switch for starting and stopping and a low-voltage release attachment, which protects the motor in case the current, for any reason, should be interrupted and then come on again, since the pointer must then be returned to 0 before the motor will start.

Dimensions: Outside diameter, 19 inches; height, cover closed, 26 inches. Net weight, 220 pounds; shipping weight, 325 pounds. Packing case: 24x24x43 inches.

79M1 Centrifuges, Electric, International, Size 1, Type SB. With type QV rheostat, without head, tubes, or stand; for 110 volts, A. C., 25 to 60 cycle. **Each**..........**$220.00**

79M2 Centrifuges, Electric, International, Size 1, Type SB. Same as 79M1, except for 220 volts, A. C., 50 to 60 cycle. **Each**..........**$220.00**

79M3 Stands, Portable, Vibrationless. With electric installation (2 wire) consisting of an 8-foot portable cord and plug. Made of iron and steel; finished in aluminum paint; mounted on four ball bearing casters with Bakelite composition wheels. Brings top of centrifuge to a convenient height of 39 inches. Equipped with three sets of rubber cushions and rubber sockets for locating. Weight, pounds: net, 60; shipping, 80. **Each**..........**$35.00**

Note: Accessories on following pages.

79M4

Centrifuges, Electric, International, Size 2. Designed for large capacity and heavy duty. Has maximum speeds varying between 1500 R. P. M. and 3600 R. P. M. with corresponding maximum relative centrifugal forces (R. C. F.) varying between 600 x gravity and 2800 x gravity. Mounted on heavy base casting which is provided with recesses for six rubber cushions and holes for bolting to foundation or portable stand. Equipped with a hand brake for rapid stopping, and a brush release arrangement. Removable hand hole plates cover openings in side of the base casting to prevent contact with live parts of the motor.

Size 2 electric motor, integral with machine. Built for standard 110 and 220 voltages. 110 volt motor, including rheostat, may be used interchangeably on either A. C. or D. C.; 220 volt motor is not interchangeable. Motor has an efficient oil-lubricating system with reservoir for each bearing; requires only occasional attention.

Type QV rheostat is self-enclosed; has dial movement with 50 steps of speed control and integral with it is a switch for starting and stopping the centrifuge, and a low voltage release attachment to prevent damaging the motor in case the current is interrupted and then comes on again. Dimensions: Outside diameter, 24 inches; height, cover closed, 28 inches; height, cover open, 40 inches; base diameter, 21½ inches. Weight, pounds (including rheostat): net, 260; shipping, 400. Centrifuge packing case: 30x31x34 inches. Rheostat packing case: 22x19x13 inches.

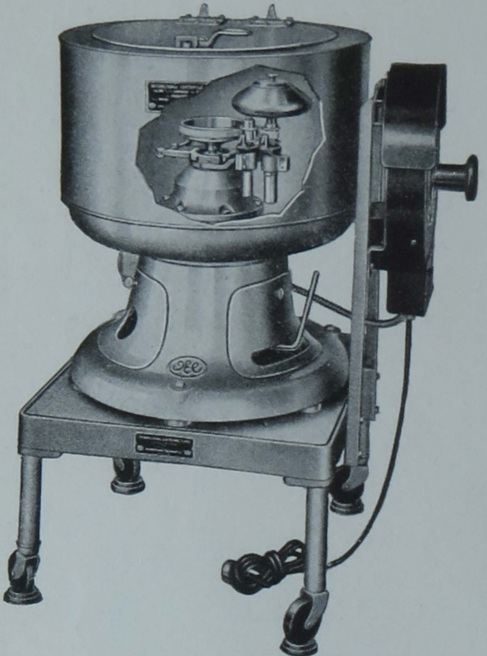
79M4 Centrifuges, Electric, International, Size 2. With Type QV rheostat, but without equipment of heads, tubes, stand; for 110 volts, A. C. 25 to 60 cycle. **Each**....**$285.00**

79M5 Centrifuges, Electric, International, Size 2. Same as 79M4, except for 220 volts A. C., 50 to 60 cycle. (Can not be furnished for 25, 30 or 40 cycles.) **Each**.........**$285.00**

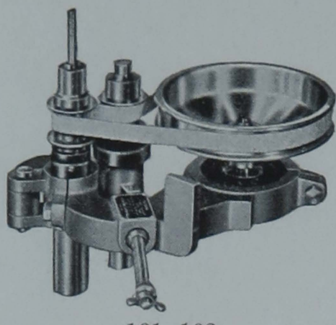
79M6 Stands, Portable, Vibrationless. With electric installation (2 wire) consisting of an 8-foot portable cord and plug and a 3-foot armored cable. Made of iron and steel; finished in aluminum paint; mounted on four ball bearing casters with Bakelite composition wheels. Brings top of centrifuge to height of 40 inches. Equipped with three sets of rubber cushions and rubber sockets for locating. Weight, pounds: net, 75; shipping, 110. **Each**..............**$37.00**

79M7 Centrifuges, Refrigerated. Details and prices on request.

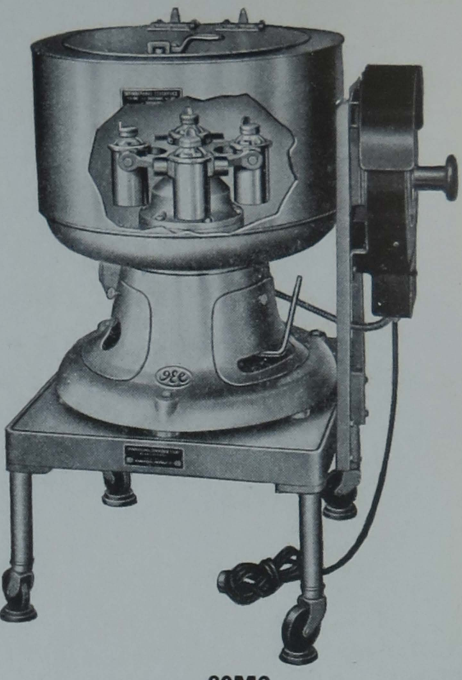
Centrifuges, Continued



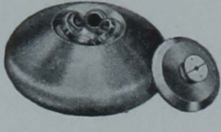
80M1



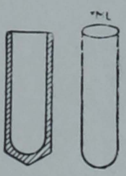
101, 102
80M3, 80M4



80M2



295
80M5



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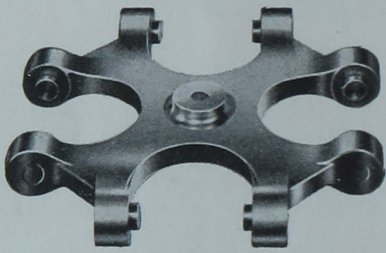
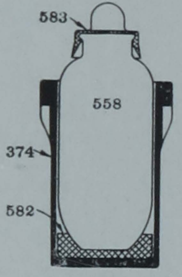
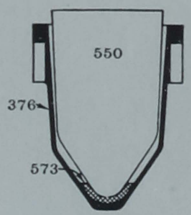
80M6, 80M7



277
80M8



374, 384, 582
80M10



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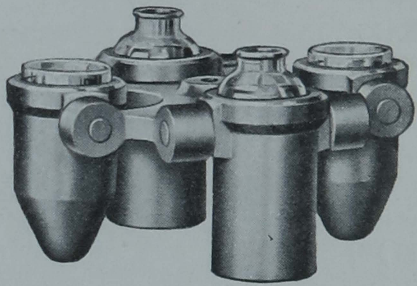
80M13



278, 374, 376
80M9

Reinforcing and High Speed Equipment. For Size 1, Type SB, and Size 2, International Centrifuges. Described on Page 79

Guards, All Welded, Heavy Steel. Must be used with high-speed equipment but do not interfere with the use of standard equipment. Readily interchangeable with the standard guards.

80M1 Guards, All Welded, Heavy Steel. For size 1, Type SB centrifuges. **Each**............................**$55.00**

80M2 Guards, All Welded, Heavy Steel. For size 2 centrifuges. **Each**..................................**$80.00**

Multi-Speed Attachments. For use with size 1, Type SB and size 2 centrifuges when reinforced with 80M1 and 80M2 all-welded heavy steel guards. Interchangeable with all other heads for these centrifuges. Can be operated at a speed of 18,000 R. P. M. and gives a relative centrifugal force as high as 25,000 x gravity.

80M3 Multi-Speed Attachments No. 101. With two belts but without head for use on size 1, Type SB centrifuges. **Each**..**$90.00**

80M4 Multi-Speed Attachments No. 102. With two belts but without head for use on size 2 centrifuges. **Each**..**$90.00**

80M5 Heads, Six Place, No. 295. For use with 80M3 and 80M4 Multi-speed attachments. Made from duralumin and specially designed to meet the stress of the great centrifugal force produced by the multi-speed attachment. Complete with six 80M6 rubber finger cushions and six 80M7 glass tubes 7 ml. **Each**..............................**$60.00**

80M6 Molded Rubber Finger Cushions No. 586. For 80M7 tubes. **Each**..............................**$ .80**

80M7 Centrifuge Tubes No. 518. Special 7 ml. tube of Pyrex glass for 80M5 head. **Dozen**................**$1.40**

Pin Type Heads and Slotted Cups. For use with size 1 Type SB and size 2 centrifuges when reinforced with 80M1 and 80M2 all welded heavy steel guards. Head of manganese bronze with stainless steel pins. Cups are slotted on the sides to set down over the pins. Manganese bronze cups are recommended for liquids of specific gravity not greater than 1.5. Forged duralumin cups are recommended for liquids of specific gravity greater than 1.5 and not exceeding 2.25.

80M8 Heads, Four Place, Pin Type, No. 277. For 80M10 250 ml. slotted cups. **Each**.......................**$34.50**

80M9 Heads, Four Place Combination, Pin Type, No. 278. For two 80M10 250 ml. cups and two 80M13 250 ml. conical cups. **Each**..............................**$46.00**

80M10 Cups, 250 ml. Bronze, Slotted, No. 374. Diameter, 2¾ inches; length, 4¾ inches; with 80M12 rubber cushion for 80M15 250 ml. bottle. **Each**.......................**$8.50**

80M11 Cups, 250 ml. Duralumin, Slotted, No. 384. Diameter, 2¾ inches; length, 4¾ inches; with 80M12 rubber cushion, for 80M15 250 ml. bottle. **Each**...........**$18.50**

80M12 Rubber Cushion, No. 582. For 80M10 and 80M11 metal cups. **Each**...............................**$ .70**

80M13 Cups, Bronze, Slotted, Conical, No. 376. With 80M14 rubber cushion, for 80M17 250 ml. conical glass cup. **Each**.......................................**$12.00**

80M14 Rubber Cushion, No. 573. For 80M13 conical metal cup. **Each**.......................................**$ .50**

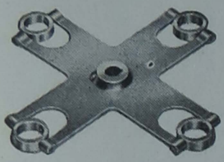
80M15 Bottles, Narrow Mouth, No. 558. Of heavy glass for 80M10 and 80M11 cups. Capacity, 250 ml. **Dozen**..**$3.65**

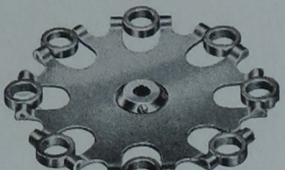
80M16 Rubber Caps, No. 583. For use on 80M15 bottle. **Dozen**..**$2.40**

80M17 Cups, Conical Bottom, No. 550. Of heavy pressed glass for 80M13 cups. Capacity, 250 ml. **Each**.......**$ .75**

Centrifuges, Continued

Centrifuge Heads and Accessories Especially for Size 1, Type C, and Size 1, Type SB International Centrifuges
Additional Heads and Accessories for Same Centrifuges Shown on Page 83


220
81M1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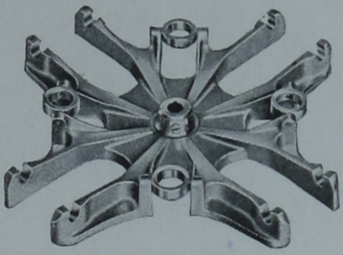
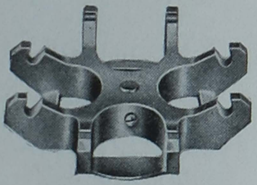
81M2


233
81M3

228
81M4


229
81M5

Accessories for All Heads Listed Below Shown on Pages 84 and 85

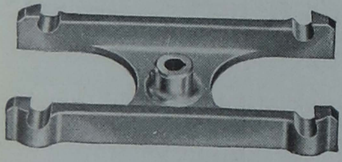
81M1 Heads, 4-Place, No. 220. With attached trunnion rings, for 15 ml. Cornell Style metal tubes, No. 302. Without tubes. **Each**.. **$8.25**

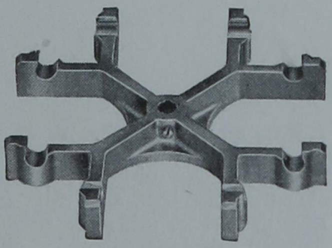
81M2 Heads, 8-Place, No. 225. With attached trunnion rings, for 15 ml. Cornell Style metal tubes, No. 302. Without tubes. **Each**.. **$15.00**

81M3 Heads, 8-Place, Combination, No. 233. With attached trunnion rings, for four 15 ml. Cornell Style metal tubes, No. 302, and four places for the following equipment: 50 ml. Cornell Style metal tubes, No. 320 and trunnion rings, No. 325 (metal tube, No. 320 will accommodate 10 ml., 15 ml., and 25 ml. glass tubes when used with Nos. 312 and 313 reducing caps), 3-place trunnion carriers, No. 355, 4-place trunnion carriers, No. 354, and Babcock trunnion cups No. 362. Head only, with attached 15 ml. trunnion rings. **Each**.. **$17.75**

81M4 Heads, 2-Place, No. 228. For 100 ml. Cornell Style metal tubes, No. 340, and trunnion rings, No. 350. Without tubes or rings. **Each**.. **$8.50**

81M5 Heads, 4-Place, No. 229. For 100 ml. Cornell Style metal tubes, No. 340, and trunnion rings, No. 350. Without tubes or rings. **Each**.. **$11.50**


235
81M6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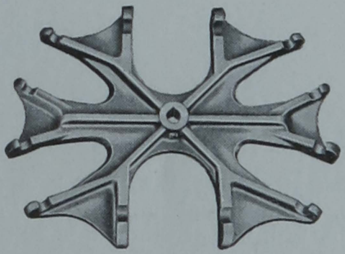
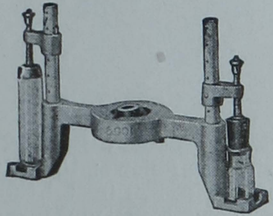
81M7


234
81M8


6001
81M9

81M6 Heads, 2-Place, No. 235. For 250 ml. trunnion cups, Nos. 373 and 373A, Squibb's trunnion carriers, No. 392, and 100 ml. funnel shape oil tube and Goetz tube trunnion carriers, No. 395. Without cups and carriers. **Each**.................... **$9.50**

81M7 Heads, 4-Place, No. 242. For 250 ml. trunnion cups, Nos. 373 and 373A, Squibb's trunnion carriers, No. 392, 100 ml. funnel shape oil tube and Goetz tube trunnion carriers, No. 395, modified Babcock metal tube, No. 367A, and trunnion ring, No. 364. Head only, without equipment. **Each**.. **$11.75**

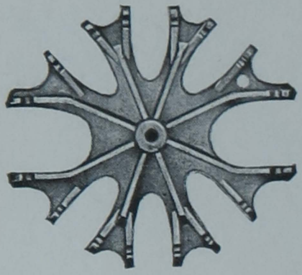
81M8 Heads, 6-Place, Combination, No. 234. Four places for the following equipment: 50 ml. Cornell Style metal tubes, No. 320, and trunnion rings, No. 325 (metal tube, No. 320, will accommodate 10 ml., 15 ml., and 25 ml. glass tubes when used with Nos. 312 and 313 reducing caps); 3-place trunnion carriers, No. 355, and 4-place trunnion carrier, No. 354. Two places for 250 ml. trunnion cups, Nos. 373 and 373A; Squibb's trunnion carriers, No. 392; and 100 ml. funnel shape oil tube and Goetz tube trunnion carriers, No. 395. Head only, without equipment. **Each**.. **$16.50**

81M9 Heads, Shaking, No. 6001. Two-bottle, 50 ml. **Each**.. **$32.00**

Accessories for All Heads Listed Above Shown on Pages 84 and 85

Centrifuges, Continued

Centrifuge Heads and Accessories Especially for Size 2, International Centrifuges
Additional Heads and Accessories for Same Centrifuges Shown on Page 83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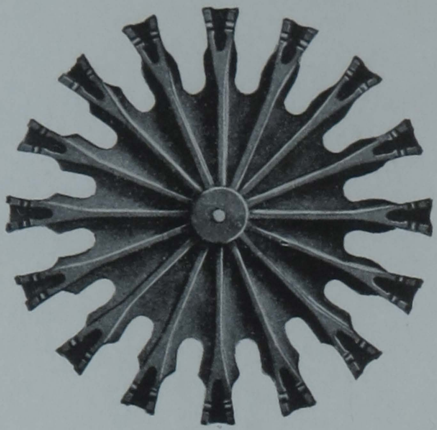
82M1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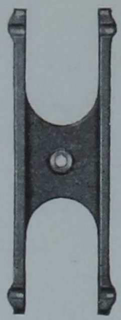
82M2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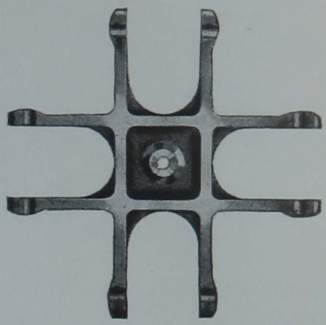
82M3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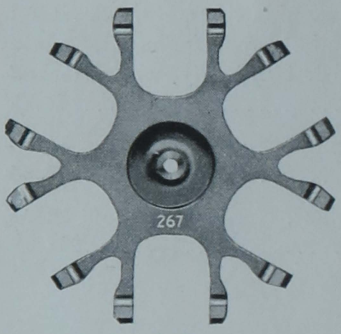
82M4



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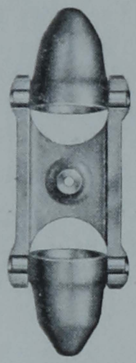
82M5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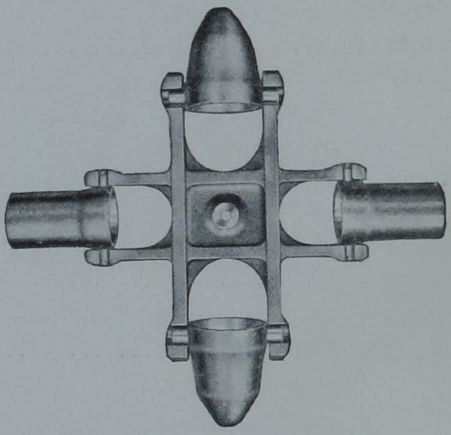
82M6


238
82M7

Accessories for All Heads Listed Below Shown on Pages 84 and 85

82M1 Heads, 8-Place Combination, No. 241. Six places for the following equipment—Cornell Style metal tubes and trunnion rings as follows: 15 ml. tube, No. 302, and ring, No. 310; 50 ml. tube, No. 320, and ring, No. 325; 100 ml. tube, No. 340, and ring, No. 350 (metal tube, No. 320, will accommodate 10 ml., 15 ml., and 25 ml. glass tubes when used with Nos. 312 and 313 reducing caps); multiple carriers, 3-place, No. 355, 4-place, No. 354, and 6-place, No. 358; oil tubes, No. 367; and Sherrill tubes, No. 309, to be used with trunnion rings, No. 366, and Babcock cups, No. 362. Two places for the following equipment: 250 ml. trunnion cups, No. 373; 8-ounce trunnion cups, No. 378; Squibb carriers, No. 392; Goetz carriers, No. 395; and metal oil tubes, No. 367A, for trunnion rings, No. 364. Head only, without equipment. **Each**.......................................**$21.50**

82M2 Heads, 16-Place, No. 250. For the following equipment—Cornell Style metal tubes and trunnion rings as follows: 10 ml. tubes, No. 356; 15 ml. tubes, No. 303; and ring, No. 310; 50 ml. tubes, No. 320, and ring, No. 325 (metal tube, No. 320, will accommodate 10 ml., 15 ml. and 25 ml. glass tubes when used with Nos. 312 and 313 reducing caps); multiple carriers, 3-place, No. 355, 4-place, No. 354, 6-place, No. 358, and Babcock trunnion cups, No. 362. Head only, without equipment. **Each**...**$36.50**

82M3 Heads, 2-Place, No. 236. For 250 ml. trunnion cups, Nos. 373 and 373A; 8-ounce trunnion cups, No. 378; Squibb carriers, No. 392; Goetz carriers, No. 395; and metal oil tubes, No. 367A for trunnion rings, No. 364. Head only, without equipment. **Each**.......................................**$14.50**

82M4 Heads, 4-Place, No. 239. For all of the equipment listed under 82M3. Head only. **Each**......................**$19.00**

82M5 Heads, 6-Place, No. 267. For all of the equipment listed under 82M3. Head only. **Each**......................**$33.50**

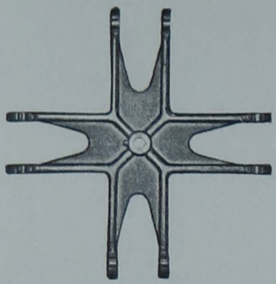
82M6 Heads, 2-Place, No. 237. For 250 ml. conical trunnion cups, No. 375, only. Without cups. **Each**..............**$21.50**

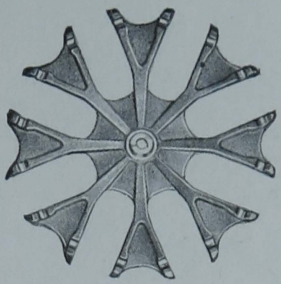
82M7 Heads, 4-Place Combination, No. 238. Two places for 250 ml. conical trunnion cups, No. 375; and two places for the following equipment: 250 ml. trunnion cups, Nos. 373 and 373A; 8-ounce trunnion cups, No. 378; Squibb carriers, No. 392; Goetz carriers, No. 395; and metal oil tubes, No. 367A for trunnion rings, No. 364. Head only, without equipment. **Each**....**$27.75**

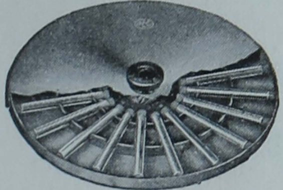
Accessories for All Heads Listed Above Shown on Pages 84 and 85

Centrifuges, Continued

Other Centrifuge Heads and Accessories for Size 1, Type C, Size 1, Type SB, and Size 2 International Centrifuges


251
83M1


240
83M2


270
83M3

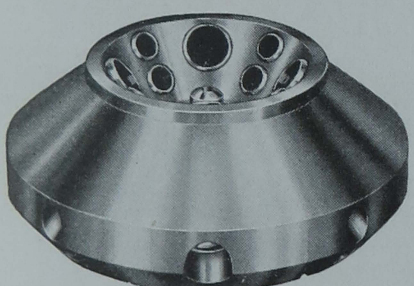
Accessories for all Heads Listed Below Shown on Pages 84 and 85

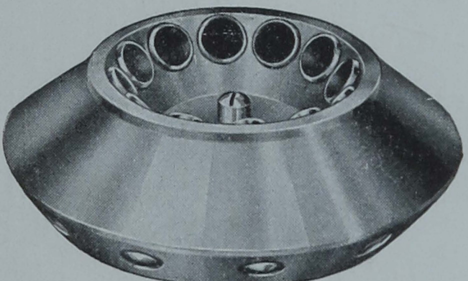
83M1 Heads, 4-Place, No. 251. For the following equipment—Cornell Style metal tubes and trunnion rings as follows: 15 ml, tube, No. 302 and ring, No. 310; 50 ml. tube, No. 320 and ring, No. 325 (metal tube No. 320 will accommodate 10 ml., 15 ml., and 25 ml. glass tubes when used with Nos. 312 and 313 reducing caps); 100 ml. tube, No. 340 and ring, No. 350; multiple carriers, 3-place, No. 355 and 4-place, No. 354; and Babcock cups, No. 362. Head only, without equipment. **Each**......... **$11.50**

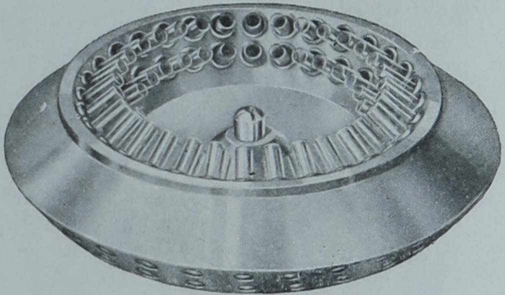
83M2 Heads, 8-Place, No. 240. For all of the equipment listed under 83M1. Head only. **Each**.................... **$15.00**

Special equipment for 83M1 and 83M2 heads to be used in the Size 2 Centrifuge only: Oil tubes, No. 367; Sherrill tubes, No. 309 to be used with trunnion rings, No. 366; and 6-place multiple carrier, No. 358.

83M3 Heads, Sediment Discs, Board of Health, No. 270. Will accommodate twenty 2 ml. Board of Health glass tubes. Without tubes. **Each**.. **$26.50**


813
83M5


822
83M7


838
83M10

Conical Heads. Embody the sloping sedimentation principle with tubes held in the head at a fixed angle to the vertical axis of rotation. Made from a magnesium alloy for strength and lightness, machined all over and highly polished to reduce air friction, the conical head permits greatly increased speeds over regular equipment. The head is secured to the shaft by means of a positive locking, taper sleeve adapter made of stainless steel to prevent corrosion.

Conical Heads for Size 1, Type C, Size 1, Type SB, and Size 2 Centrifuges

83M4 Conical Heads, 8-Place, No. 812. For eight 50 ml. Cornell Style metal tubes, No. 320. Without tubes. **Each**.. **$70.00**

83M5 Conical Heads, 12-Place Combination, No. 813. Eight places for 15 ml., No. 302, and four places for 50 ml., No. 320 Cornell Style metal tubes. Without tubes. **Each**.. **$70.00**

83M6 Conical Heads, 12-Place Combination, No. 814. Eight places for 15 ml., No. 302, two places for 50 ml., No. 320, and two places for 100 ml., No. 340, Cornell Style metal tubes. Without tubes. **Each**................................ **$70.00**

Conical Heads for Size 1, Type SB, and Size 2 Centrifuges Only

83M7 Conical Heads, 12-Place, No. 822. For twelve 50 ml. Cornell Style metal tubes, No. 320. Without tubes. **Each**.. **$80.00**

83M8 Conical Heads, 16-Place Combination, No. 823. Eight places for 15 ml., No. 302, and eight places for 50 ml., No. 320, Cornell Style metal tubes. Without tubes. **Each**.. **$80.00**

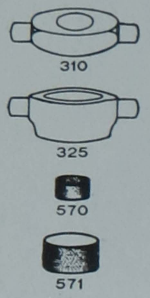
Conical Heads for Size 2 Centrifuges Only

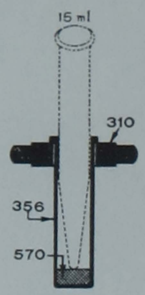
83M9 Conical Heads, 20-Place Combination, No. 833. Eight places for 15 ml., No. 302, eight places for 50 ml., No. 320, and four places for 100 ml., No. 340, Cornell Style metal tubes. Without tubes. **Each**................................ **$87.00**

83M10 Conical Heads, 60-Place, No. 838. For 10 ml. Cornell Style metal tubes, No. 356, to hold agglutinating glass tubes, 100 mm. by 13 mm. Without tubes. **Each**.. **$90.00**

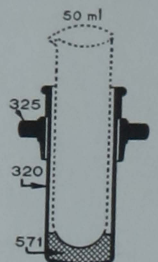
Accessories for All Heads Listed Above Shown on Pages 84 and 85

Centrifuge Head Accessories

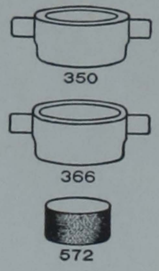

310
325
570
571

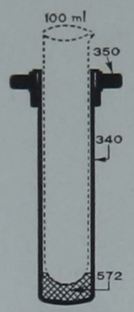

15 ml
310
356
570

310, 356, 570

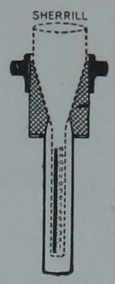

50 ml
325
320
571

325, 320

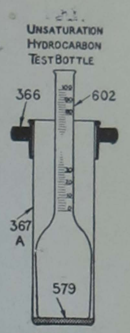



100 ml
350
340
572

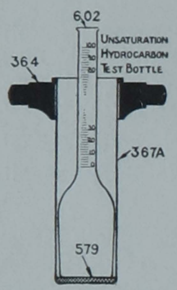
350, 340



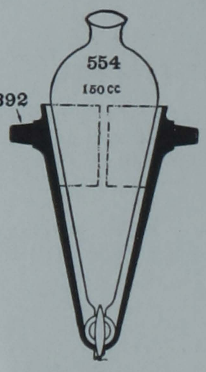
366, 309


UNSATURATION HYDROCARBON TEST BOTTLE
366
602
367 A
579

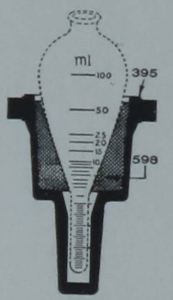
367A, 366


602
UNSATURATION HYDROCARBON TEST BOTTLE
364
367A
579

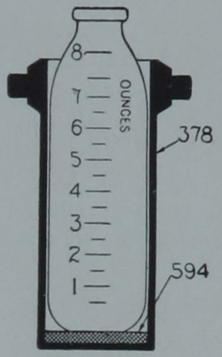
364, 367A, 579


554
150 cc
392

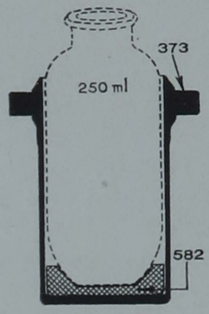
392, 596


ml
100
50
25
20
15
10
395
598

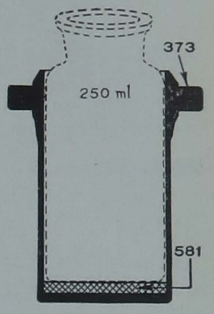
395, 598


8
7
6
5
4
3
2
1
OUNCES
378
594

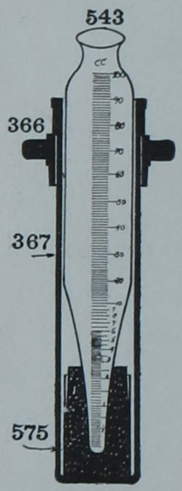
378, 594,


373
250 ml
582

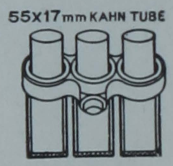
373, 582


373
250 ml
581

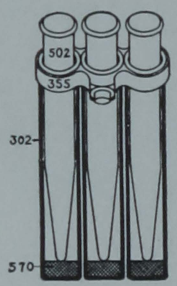
373A, 581


543
cc
366
367
575

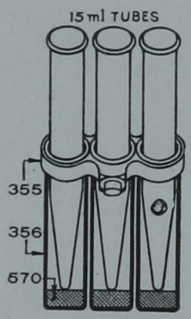
367, 366


55X17 mm KAHN TUBE

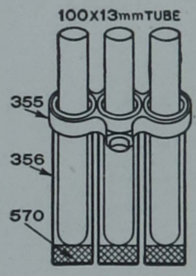
355, 304


502
355
302
570

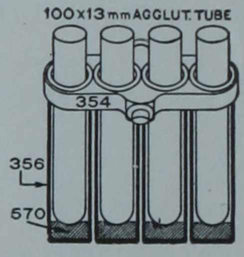
355, 302


15 ml TUBES
355
356
570

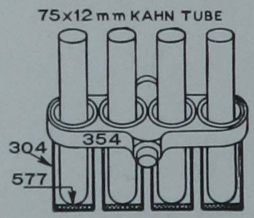
355, 356


100X13 mm TUBE
355
356
570

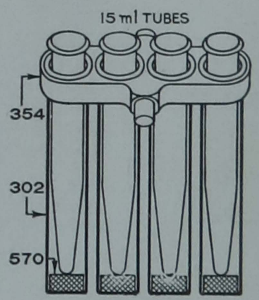
355, 356


100x13 mm AGGLUT. TUBE
354
356
570

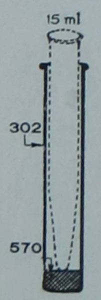
354, 356


75x12 mm KAHN TUBE
354
304
577

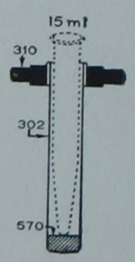
354, 304


15 ml TUBES
354
302
570

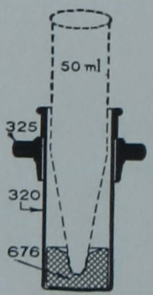
354, 302


15 ml
302
570

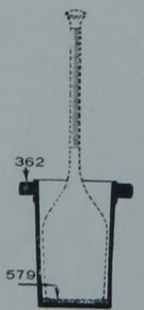
302, 570


15 ml
310
302
570

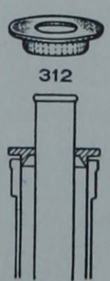
310, 302


50 ml
325
320
676

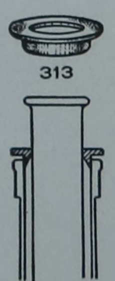
320, 676



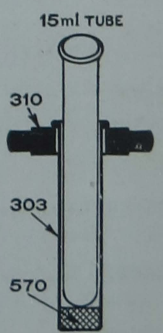
362, 579



312



313


15 ml TUBE
310
303
570

310, 303

Centrifuge Accessories

Centrifuge Head Accessories
For Size 1, Type C, Size 1, Type SB, and Size 2, International Centrifuges

85M1 Trunnion Rings, 15 ml., No. 310. For Cornell Style metal tubes, Nos. 302 and 356; and heads, Nos. 228, 229, 240, 241, 250 and 251. **Each**..........................$ .90

85M2 Trunnion Rings, 50 ml., No. 325. For Cornell Style metal tubes, No. 320; and heads, Nos. 233, 234, 240, 241, 250 and 251. **Each**..........................$ .60

85M3 Trunnion Rings, 100 ml., No. 350. For Cornell Style metal tubes, No. 340; and heads, Nos. 228, 229, 240, 241 and 251. **Each**..........................$ .70

85M4 Trunnion Rings, No. 366. For Sherrill metal tubes, No. 309; and metal oil tubes, Nos. 367 and 367A; and heads, Nos. 228, 229, 240, 241 and 251. **Each**.............$ .80

85M5 Trunnion Carriers, 3-Place, No. 355. For Cornell Style metal tubes, Nos. 302, 304 and 356; and heads, Nos. 233, 234, 240, 241, 250 and 251. **Each**..............$1.25

85M6 Trunnion Carriers, 4-Place, No. 354. For use in Size 1, Type SB, and Size 2 centrifuges only. For Cornell Style metal tubes, Nos. 302, 304 and 356; and heads, Nos. 233, 234, 240, 241, 250 and 251. **Each**.................$ 1.85

85M7 Trunnion Carriers, 6-Place, No. 358. For metal tubes, No. 304 only. For heads Nos. 240, 241, 250 and 251. **Each**..$2.60

85M8 Trunnion Rings, No. 364. For metal oil tubes, No. 367A; and heads, Nos. 239, 241, 242 and 267. **Each**..$2.20

85M9 Trunnion Carriers, No. 392. For Squibb separatory funnels, and heads, Nos. 234, 235, 236, 238, 239, 241, 242 and 267. With set of rubber cushions, Nos. 596. **Each**..$5.75

85M10 Rubber Cushions, No. 596. For trunnion carriers, No. 392 (set of upper and lower). **Set**..............$1.45

85M11 Trunnion Carriers, No. 395. For 100 ml. funnel shaped oil tubes, 100 ml. Goetz phosphorous tubes, and heads, Nos. 234, 235, 236, 238, 239, 241, 242 and 267. With rubber cushion, No. 598..........................**Each** $4.50

85M12 Rubber Cushions, No. 598. For trunnion carriers, No. 395. **Each**..........................$ .90

85M13 Trunnion Cups, No. 373. For 250 ml. round bottom, narrow mouth bottle, and heads, Nos. 234, 235, 236, 238, 239, 241, 242 and 267. With rubber cushion, No. 582. **Each**..$6.50

85M14 Rubber Cushions, No. 582. For trunnion cups, No. 373. **Each**..........................$ .70

85M15 Trunnion Cups, No. 373A. For 250 ml., flat bottom, wide mouth bottle, and heads, Nos. 234, 235, 236, 238, 239, 241, 242 and 267. With rubber cushion No. 581. **Each**..$6.20

85M16 Rubber Cushions, No. 581. For trunnion cups, No. 373A. **Each**..........................$ .40

85M17 Trunnion Cups, No. 378. For 8-ounce round nursing bottles, commercial oil sample bottles, and heads, Nos. 236, 238, 239, 241 and 267. With rubber cushion, No. 594. **Each**..$6.25

85M18 Rubber Cushions, No. 594. For trunnion cups, No. 378. **Each**..........................$ .40

85M19 Metal Tubes, No. 302. Cornell Style, 15 ml. For trunnion rings, No. 310; and heads, Nos. 220, 225, 228, 229, 233, 240, 241 and 251. With rubber cushion, No. 570. **Each**..$ .75

85M20 Rubber Cushions, No. 570. For metal tubes, Nos. 302, 303, 306 and 356. **Dozen**....................$ .90

85M21 Metal Tubes, No. 320. Cornell Style, 50 ml. For trunnion rings, No. 325; and heads, Nos. 233, 234, 240, 241, 250 and 251. With rubber cushion, No. 571. **Each**....$ .90

85M22 Rubber Cushions, No. 571. For metal tubes, No. 320. **Dozen**..........................$1.80

85M23 Rubber Cushions, No. 676. For metal tubes No. 320. **Dozen**..........................$2.00

85M24 Reducing Caps, No. 312. For supporting 10 ml. and 15 ml. glass tubes in 50 ml. metal tubes, No. 320. **Each**.$ .15

85M25 Reducing Caps, No. 313. For supporting 25 ml. glass tubes in 50 ml. metal tubes, No. 320. **Each**...$ .15

85M26 Metal Tubes, No. 340. Cornell Style, 100 ml. For trunnion rings, No. 350; and heads, Nos. 228, 229, 240, 241, and 251. With rubber cushion, No. 572. **Each**.......$1.25

85M27 Rubber Cushions, No. 572. For metal tubes, No. 340. **Dozen**..........................$2.40

85M28 Metal Tubes, No. 367A. For 6-inch modified Babcock oil bottle in trunnion rings, Nos. 364 and 366; and heads, Nos. 236, 238, 239, 240, 241, 242, 251 and 267. With rubber cushion, No. 579. **Each**..........................$1.15

85M29 Trunnion Cups, No. 362. For 6-inch Babcock bottles only; and heads, Nos. 233, 240, 241, 250 and 251. With rubber cushions, No. 579. **Each**....................$ .90

85M30 Rubber Cushions, No. 579. For Babcock cups and metal tubes, Nos. 362 and 367A. **Dozen**............$ .60

85M31 Metal Tubes, No. 304. For 55x17 mm. Kahn vials. For multiple carriers, Nos. 354, 355 and 358; and heads, Nos. 240, 241, 250 and 251. With rubber cushion, No. 577. **Each**..$ .70

85M32 Rubber Cushions No. 577. For metal tubes, No. 304. **Dozen**..........................$ .40

85M33 Metal Tubes, No. 356. Cornell Style, 10 ml. For trunnion rings, No. 310; and multiple carriers, Nos. 354 and 355. May also be used in the Size 2 Centrifuge with head, No. 250 and 6-place multiple carrier, No. 358. With rubber cushion, No. 570. **Each**..........................$ .70

85M34 Metal Tubes, No. 367. For 100 ml. A. S. T. M. oil tubes. Used with trunnion rings, No. 366; and heads, Nos. 240, 241 and 251. With rubber cushion, No. 575. **Each**.$1.90

85M35 Rubber Cushions, No. 575. For metal oil tubes, No. 367. With brass shield. **Each**................$ .85

85M36 Metal Tubes, No. 309. For holding Sherrill potash tubes. Used with trunnion rings, No. 366; and heads, Nos. 228, 229, 240, 241 and 251. With rubber cushions, No. 563. **Each**..$4.25

85M37 Rubber Cushions, No. 563. For Sherrill metal tubes, No. 309. **Each**..........................$1.10

85M38 Metal Tubes, No. 303. Cornell Style, 10 and 15 ml. Used with trunnion rings, No. 310; and head, No. 250. With rubber cushion, No. 570. **Each**....................$ .75

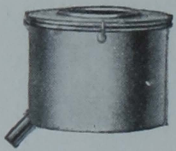
85M39 Trunnion Cups, No. 375. For 250 ml. conical glass cups and heads, Nos. 237 and 238 only. With rubber cushions, No. 573. **Each**..........................$8.75

85M40 Rubber cushions, No. 573. For trunnion cups, No. 375. **Each**..........................$ .50

Centrifuges, Continued

Centrifuge Basket Heads for Size 1, Type C, Size 1, Type SB, and Size 2 International Centrifuges

1345
86M1



1360
86M2

1346
86M4

1347
86M5

1361
86M6

86M1 Basket Heads, No. 1345. 5 inches in diameter; of perforated manganese bronze with stainless steel adapter sleeve. Cake capacity, 0.3 liters. For types C and SB, and Size 2 Centrifuges. **Each**.......... **$32.50**

86M2 Draining Chambers, No. 1360. Of nickeled copper. For baskets, No. 1345. For types C and SB Centrifuges. **Each**. **$20.00**

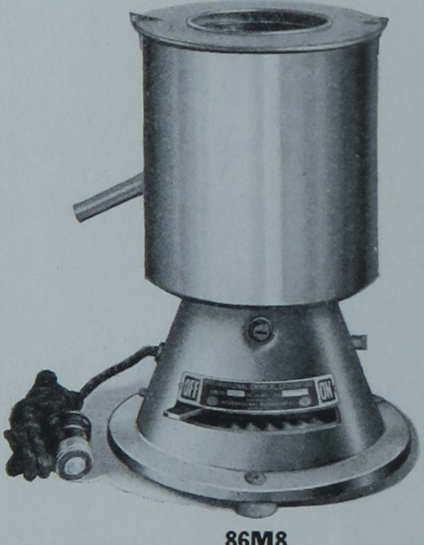
86M3 Draining Chambers, No. 1363. Of nickeled copper. For baskets, No. 1345. For size 2 Centrifuges. **Each**...... **$20.00**

86M4 Basket Heads, No. 1346. 8 inches in diameter; of perforated manganese bronze with stainless steel adapter sleeve. Cake capacity, 1.5 liters. For types C and SB and Size 2 Centrifuges. **Each**.......... **$38.00**

86M5 Basket Heads, No. 1347. 8 inches in diameter; of perforated manganese bronze with removable top flange and stainless steel adapter sleeve. Cake capacity, 2 liters. For types C and SB and Size 2 Centrifuges. **Each**.......... **$70.00**

86M6 Draining Chambers, No. 1361. Of nickeled copper. For baskets, Nos. 1346 and 1347. For types C and SB Centrifuges. **Each**.......... **$25.00**

86M7 Draining Chambers, No. 1362. Of nickeled copper. For baskets, Nos. 1346 and 1347. For Size 2 Centrifuges. **Each**. **$26.00**



86M8

86M8 Centrifuges, Electric, International, Chemical. The 5-inch basket head chemical centrifuge has been developed to meet the need of a small experimental tool for research. Especially suited for the industrial-chemical laboratory, and where the character of the work does not require a large and powerful centrifuge. Can be used for continuous operation with maximum speed of 3600 R. P. M. and giving a relative centrifugal force of 850 x gravity.

The draining chamber is of thick copper tubing, nickel-plated and tin lined with cover and spout. The standard basket as furnished is perforated, of manganese bronze, 5 inches in diameter by 2½ inches deep, with ¾-inch flange, secured by nut to tapered shaft. Stainless steel, porcelain and rubber coated baskets are also available on request. The draining chamber and perforated basket are readily removable and interchangeable with aluminum guard bowl and analytical heads and tubes as offered with the clinical centrifuge (see page 78). This feature enables the procurement of a combination centrifuge at slight additional cost.

The Universal type motor will operate on any lighting circuit, either A. C. or D. C., and is supplied with a seven-step speed control rheostat mounted in the base.

Diameter of draining chamber, 6 inches; diameter of base, 8 inches; height, 12 inches.

Net weight, 24 pounds. Shipping weight, 30 pounds.

Complete with standard 5-inch diameter perforated basket and copper draining chamber, 6 feet of flexible cord and attachment plug. For 110 volts, A. C. or D. C. **Each**. **$90.00**

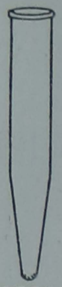
86M9 Centrifuges, Electric, International, Clinical. Same as 86M8, except for 220 volts, A. C. or D. C. **Each**.......... **$100.00**

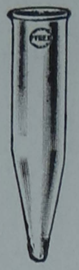
86M10 Basket Heads, No. 1343. 5 inches in diameter; of perforated manganese bronze. **Each**.......... **$29.00**

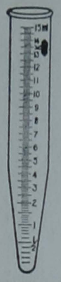
86M11 Draining Chambers, No. 1365. Of nickeled copper. **Each**.......... **$29.00**

86M12 Guard Bowls, No. 1377. Of cast aluminum. Permits the use of standard heads and tubes with the Chemical Centrifuge. **Each**.......... **$19.50**

Centrifuge Tubes


87M1


87M3


87M6

87M1 Centrifuge Tubes. Ungraduated. With cone point. Capacity, 10 ml. **Each, $ .06. Case** of 72.......... **$3.89**

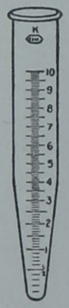
87M2 Centrifuge Tubes. Same as 87M1, except with capacity of 15 ml. **Each, $ .07. Case** of 144.......... **$9.07**

87M3 Centrifuge Tubes, Pyrex. Ungraduated. With cone point. Capacity, 15 ml. **Each, $ .19. Case** of 96.... **$16.42**

87M4 Centrifuge Tubes. Same as 87M1, except with capacity of 50 ml. **Each, $ .24. Case** of 72.......... **$15.55**

87M5 Centrifuge Tubes, Pyrex. Same as 87M3, except with capacity of 50 ml. **Each, $ .35. Case** of 48........ **$15.12**

87M6 Centrifuge Tubes. Graduated. With cone point. Capacity, 15 ml. Graduated in ⅒ ml.
Each, $ .30. Case of 144........................ **$38.88**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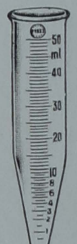
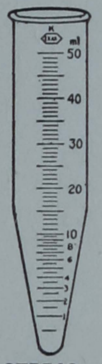

87M9


87M10

87M7 Centrifuge Tubes, Exax Blue Line. Graduated. With cone point. Capacity, 10 ml. Graduated in ⅒ ml.
Each, $ .35. Dozen, $3.78. Case of 36.......... **$10.08**

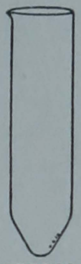
87M8 Centrifuge Tubes. Same as 87M7, except with capacity of 15 ml.
Each, $ .45. Dozen, $4.86. Case of 72........... **$25.92**

87M9 Centrifuge Tubes, Pyrex. Graduated. With cone point. Capacity, 15 ml. Graduated in ⅒ ml.
Each, $ .60. Case of 48........................ **$25.92**

87M10 Centrifuge Tubes, Exax Blue Line. Graduated. With cone point. Capacity, 50 ml. Graduated in ½ ml. to 10 ml., and in 1 ml. from 10 to 50 ml.
Each, $ .60. Dozen, $6.48. Case of 72........... **$34.56**

87M11 Centrifuge Tubes, Pyrex. Same as 87M9, except with capacity of 50 ml. Graduated to 10 ml. in ½ ml. and from 10 to 50 ml. in 1 ml.
Each, $ .85. Case of 24........................ **$18.36**

87M12 Centrifuge Tubes, Pyrex, Lifetime Red. Graduated. With cone point. Scale and figures are etched through a permanent red layer into clear glass and no filler is necessary. Capacity, 15 ml. Graduated in ⅒ ml.
Each, $ .60. Case of 48........................ **$25.92**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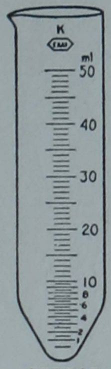
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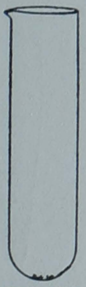

87M17

87M13 Centrifuge Tubes. Ungraduated. With short cone bottom and pourout. Capacity, 50 ml.
Each, $ .20. Case of 72........................ **$12.96**

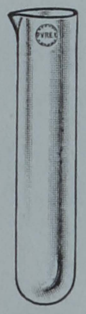
87M14 Centrifuge Tubes, Pyrex, Ungraduated. With short cone bottom and pourout. Capacity, 50 ml.
Each, $ .40. Case of 36........................ **$12.96**

87M15 Centrifuge Tubes, Exax Blue Line. Graduated. With short cone bottom and pourout. Capacity, 50 ml. Graduated to 10 ml. in ½ ml. and from 10 to 50 ml. in 1 ml.
Each, $ .60. Dozen, $6.48. Case of 72........... **$34.56**

87M16 Centrifuge Tubes, Pyrex. Graduated. With short cone bottom and pourout. Capacity, 50 ml.
Each, $ .90. Case of 24........................ **$19.44**

87M17 Centrifuge Tubes. Ungraduated. With pourout and round bottom. Capacity, 50 ml.
Each, $ .20. Case of 72........................ **$12.96**

87M18 Centrifuge Tubes. Same as 87M17, except with capacity of 100 ml.
Each, $ .25. Case of 72........................ **$16.20**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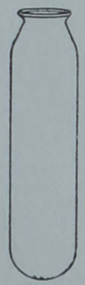
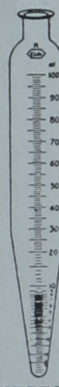

87M21


87M22

87M19 Centrifuge Tubes, Pyrex. Ungraduated. With pourout. Capacity, 50 ml.
Each, $ .30. Case of 72........................ **$19.44**

87M20 Centrifuge Tubes, Pyrex. Same as 87M19, except with capacity of 100 ml.
Each, $ .40. Case of 72........................ **$25.92**

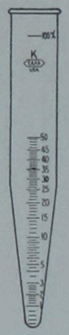
87M21 Centrifuge Tubes. Ungraduated. With narrow neck and round bottom. Capacity, 50 ml.
Each, $ .20. Case of 72........................ **$12.96**

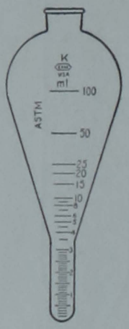
87M22 Centrifuge Tubes, Oil, Exax Blue Line. Graduated. A. S. T. M. D-96 and D-91. With narrow neck and tapered bottom. Graduated from 0 to ½ ml. in 1/20 ml., from ½ to 3 ml., in ⅒ ml.; from 3 to 5 ml. in ½ ml.; from 5 to 10 ml. in 1 ml.; from 10 to 25 ml., in 5 ml., and also at 50, 75 and 100 ml.
Each, $1.00. Dozen, $10.80. Case of 72.......... **$57.60**

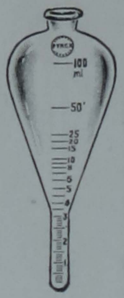
87M23 Centrifuge Tubes, Oil, Pyrex. Graduated. A. S. T. M. D-96 and D-91. In accordance with standard methods of test for water and sediment in petroleum products. Capacity, 100 ml.
Each, $1.75. Case of 12........................ **$18.90**

87M24 Centrifuge Tubes, Oil, Pyrex, Lifetime Red. Otherwise, same as 87M23.
Each, $1.75. Case of 12........................ **$18.90**

Centrifuge Tubes, Continued


88M1


88M2


88M3

88M1 Centrifuge Tubes, Exax Blue Line, A. P. I. Made in accordance with specifications given in the American Petroleum Institute Code, Number 25. Graduated from 0 to 3% in ⅕%, from 3 to 10% in ½%, from 10 to 50% in 1%, and also at 100%, 100% being equal to 12.5 ml.

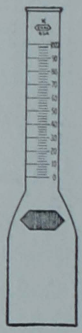
Each, $ .50. Dozen, $5.40. Case of 72............**$28.80**

88M2 Centrifuge Tubes, Oil, Exax Blue Line, A. S. T. M. D-96. Pear shaped, without stopper. Stem is graduated from 0 to 3 ml. in ⅒ ml.; the body is graduated from 3 to 5 ml. in ½ ml., from 5 to 10 ml. in 1 ml., and also at 15, 20, 25, 50 and 100 ml.

Each, $1.25. Dozen, $13.50. Case of 36...........**$36.00**

88M3 Centrifuge Tubes, Oil, Pyrex, A. S. T. M. D-96. Same as 88M2, except **Pyrex.**

Each, $1.75. Case of 12.........................**$18.90**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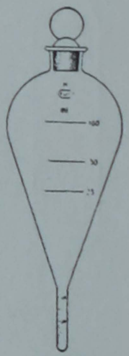
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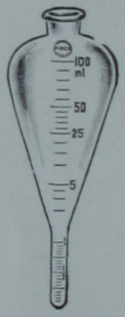

88M6

88M4 Centrifuge Tubes, Exax Blue Line. Gasoline Unsaturation Test. Neck is graduated from 0 to 100% in 2%, 100% being equivalent to 10 ml.

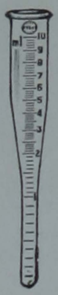
Each, $ .60. Dozen, $6.48. Case of 36............**$17.28**

88M5 Centrifuge Tubes, Exax Blue Line, Goetz. For phosphorus determinations in iron and steel. Graduated at 25, 50 and 100 ml. in bulb, and 0.01 ml. to 0.2 ml. in stem.

Each, $1.50. Dozen, $16.20. Case of 24..........**$28.80**

88M6 Centrifuge Tubes, Pyrex, Goetz. For phosphorus determinations in iron and steel. The lower stem is graduated at .05 ml. to 1 ml. and the body is graduated at 2, 3, 4, 5, 10, 15, 20, 25, 30, 40, 45, 50, 60, 70, 80, 90 and 100 ml.

Each, $1.75. Case of 12.........................**$18.90**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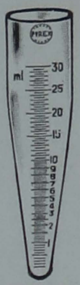
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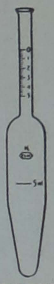

88M9

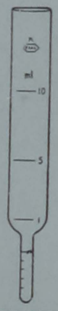
88M7 Centrifuge Tubes, Pyrex, Kolmer. For Wasserman Test. Graduated in ⅒ ml. up to 4 ml. and ⅕ ml. from 4 to 10 ml. **Each, $ .85. Case** of 24..................**$18.36**

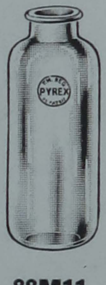
88M8 Centrifuge Tubes, Pyrex, Kolmer. Similar to 88M7, except for 30 ml. capacity; graduated to 3 ml. in ⅒, 3 to 10 ml. in ⅕, and from 10 to 30 ml. in ½ divisions.

Each, $1.20. Case of 24..........................**$25.92**

88M9 Centrifuge Tubes, Exax Blue Line, Leffman Beam. Graduated. For human milk, reading in percentage according to the Babcock method.

Each, $ .50. Dozen, $5.40. Case of 36...........**$14.40**


88M10


88M11

88M10 Centrifuge Tubes, Exax Blue Line, Hopkins Vaccine. Stem is graduated in 0.01 ml. to 0.05 ml., and the upper tube is graduated at 1, 5 and 10 ml.

Each, $ .50. Dozen, $5.40. Case of 36...........**$14.40**

88M11 Centrifuge Tubes, Bottles, Pyrex. Standard form.

Capacity, ml.	**250**	**500**	**1000**
Diameter, mm.	60	73	97
Height, mm.	142	175	216
Quantity in case	48	36	24
Each	**$ .60**	**.70**	**.80**
Case	**$25.92**	**22.68**	**17.28**

88M12 Centrifuge Tubes, Board of Health. For 83M3 sediment discs. Capacity, 2 ml. **Hundred**...........**$2.20**

88M13 Centrifuge Tubes, Soil, Truog. Round bottom, flared top. Capacity, 100 ml. **Each**..................**$ .85**

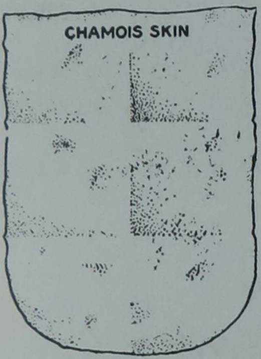
89M1

89M1 Centrifuge Tubes, Potash, Sherrill. For the rapid and accurate determination of potash by the centrifugal method.

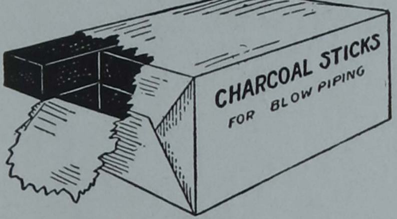
The determination is based on the relation of the precipitates formed by the sample and a standard potash solution, after treating both with a stock reagent solution and centrifuging both in Sherrill potash centrifuge tubes.

The results are quickly calculated from a simple formula and are expressed in percentage of K_2O. Twenty-five minutes or less are all that are required for a complete determination from the receipt of the sample including the calculation.

This tube is a simple one piece form consisting of tube 150 mm long, 31 mm in diameter, drawn down to a stem 2 mm in diameter. The stem is graduated from 0 to 15 and reads in percentage of K_2O when used according to the directions furnished with each tube. The Sherrill tube may be used in any ordinary laboratory centrifuge large enough to hold the standard 100 ml tube. Complete directions furnished for making potash determinations and preparing reagents. **Each**.................................**$2.00**



89M2

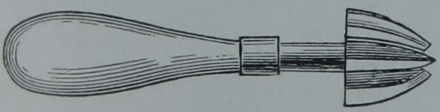


89M4

89M2 Chamois Skins. Cut and trimmed; selected quality. Suitable for filtering mercury, gasoline, etc., or for cleaning instruments and glassware. Size, approximately 17x23 inches. **Each**..**$1.35**

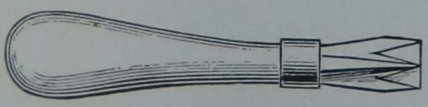
89M3 Chamois Skins. Same as 89M2, except size, approximately 24x36 inches. **Each**........................**$2.30**

89M4 Charcoal Sticks. Willow wood, kiln-burned. Used principally in blow-pipe analysis. Each stick is 1x½x4½ inches. Put up in packages containing one dozen sticks. **Each, $ .05. Dozen**...........................**$ .50**



89M5

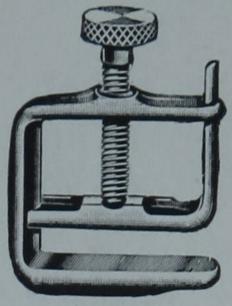
89M5 Charcoal Borers. Large; club shaped. **Each**...**$1.00**



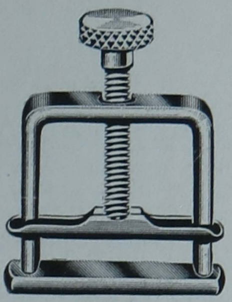
89M6

89M6 Charcoal Borers. Small; four cornered. **Each.$ .80**

Clamps

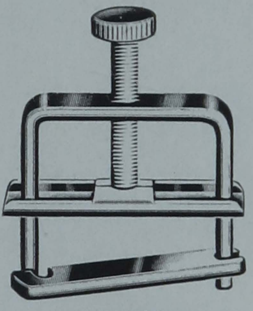


89M7



89M9

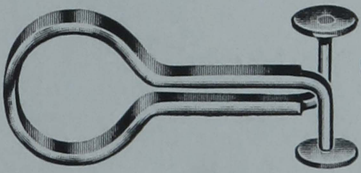
89M7 Clamps, Screw, Hoffman, Open Type. Made of brass, nickel plated. For rubber tubing. Screw can not cut tubing. Can be placed on tubing without disconnecting apparatus. Small; for tubing to ⅜ inch (10 mm.) outside diameter. Opening, ½x¾ inches. **Each**...................**$ .20**
89M8 Clamps, Screw, Hoffman ,Open Type. Same as 89M7, except larger, for tubing to ½ inch (13 mm.) outside diameter. Opening, ⅝x1 inch. **Each**..................**$ .25**
89M9 Clamps, Screw, Hoffman, Closed Type. Made of brass, nickel plated. Screw will not cut tubing. Small; for tubing to ⅜ inch (10 mm.) outside diameter. Opening, ½x⅝ inch. **Each**....................................**$ .20**
89M10 Clamps, Screw, Hoffman, Closed Type. Same as 89M9, except larger. For tubing to ½ inch (13 mm.) outside diameter. Opening ¾x⅞ inch. **Each**...............**$ .25**



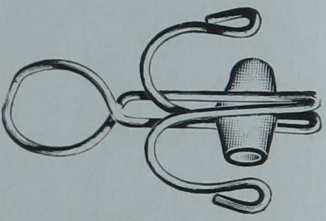
89M11

89M11 Clamps, Screw, Hoffman. Made of brass, nickel plated. With swinging lower jaw. Size of opening, ⅝x¾ inch. **Each**...........**$ .18**

89M12 Clamps, Screw, Hoffman. Same as 89M11, except with opening ¾x1 inch. **Each**............**$ .20**

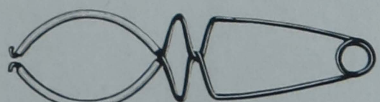


89M13



89M15

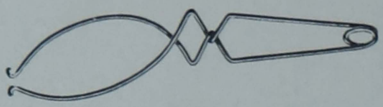
89M13 Clamps, Mohr, Pinchcock. Made of flat rolled bronze, nickel plated. Very strong and durable. For tubing to ⅜ inch (10 mm.) outside diameter. Length, 2¾ inches. **Each**..**$ .12**
89M14 Clamps, Mohr, Pinchcock. Same as 89M13, except for tubing to ½ inch (13 mm.) outside diameter. Length, 3½ inches. **Each**......................................**$ .15**
89M15 Clamps, Day Pinchcock. Heavy spring steel wire, nickel plated. Slips on or off tubing without disconnecting apparatus. For tubing up to ⅜ inch (10 mm.) outside diameter. Length, 2⅝ inches. **Each**.....................**$ .15**



89M16

89M16 Clamps, Chaddock, Beaker. Small; self closing. Steel spring wire, japanned. Rubber covered jaws. For 150 and 250 ml. beakers. Length, 8¾ inches (22 cm.). **Each**..**$ .25**
89M17 Clamps, Chaddock, Beaker. Same as 89M16, except larger. For 400 and 600 ml. beakers. Length, 12½ inches (32 cm.). **Each**.................................**$ .25**

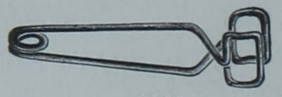
Clamps, Continued



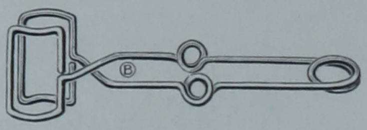
90M1

90M1 Clamps, Chaddock, Dish. Small; self closing. Steel spring wire, japanned. Plain jaws are curved to contour of dish. For dishes 2⅛ to 3⅛ inches (60 to 80 mm.) diameter. Length, 8¾ inches (22 cm.). **Each**.................. **$ .20**

90M2 Clamps, Chaddock, Dish. Same as 90M1, except larger. For dishes 3⅜ to 4⅜ inches (85 to 110 mm.) diameter. Length, 12½ inches (32 cm.). **Each**................. **$ .25**



90M3



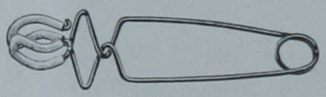
90M5

90M3 Clamps, Test Tube, Stoddard. Small; self closing. Heavy spring brass wire, burnished. Jaws retain their alignment when opened. For tubes up to 1 inch (25 mm.) diameter. Length, 5 inches (12.5 cm.). **Each**............. **$ .06**

90M4 Clamps, Test Tube, Stoddard. Same as 90M3, except larger. For tubes up to 1¾ inches (45 cm.) diameter. Length, 6 inches (15 cm.). **Each**.................... **$ .12**

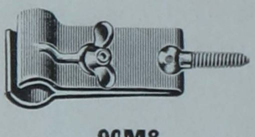
90M5 Clamps, Test Tube. Brass wire; with finger rests; 5 inches long. **Each**.................................... **$ .10**

90M6 Clamps, Test Tube. Same as 90M5, except of heavier wire, and 6½ inches long. **Each**.................... **$ .15**

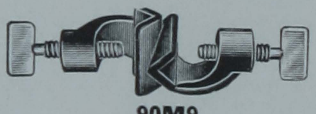


90M7

90M7 Clamps, Test Tube, Chaddock. Self closing. Steel spring wire, japanned. Rubber covered jaws. For test tubes from ⅝ to 1¼ inches (16 to 32 mm.) diameter. Length, 7¼ inches (18 cm.). **Each**............................. **$ .30**



90M8



90M9

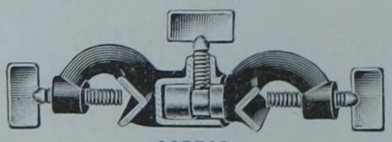
90M8 Clamps, Burette. Wall Type. Screws into molding, shelves, bottle racks, and cabinets. Heavy spring brass, nickel plated. Jaws take burettes from ½ to ¾ inches diameter. If covered with rubber tubing, jaws engage objects as small as 3/16 inch diameter. Length, excluding wood screw, 2 9/16 inches. **Each**... **$ .40**

90M9 Clamp Holders. Small, fixed. Jaws perpendicular to one another, one piece. For rods to ½ inch slipped in from side, or 9/16 inch if muff is slipped over top of rod. Length, 3½ inches. Cast iron, black japanned. **Each**............. **$ .25**

90M10 Clamp Holders. Same as 90M9, except brass, corrosion resistant. **Each**........................... **$ .40**

90M11 Clamp Holders. Large, fixed. For rods to ⅝ inch slipped in from side; or 13/16 inch if muff is slipped over top of rod. Length, 5 inches. Cast iron, black japanned. **Each $ .30**

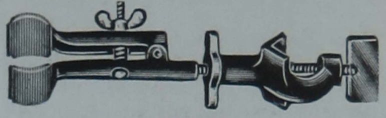
90M12 Clamp Holders. Same as 90M11, except brass, corrosion resistant. **Each**............................ **$ .50**



90M13

90M13 Clamp Holders, Universal. Jaws may be turned axially and fastened at any angle by set screw. For rods to ½ inch slipped in from side, or ⅝ inch if muff is slipped over top of rod. Length, 5 inches. Cast iron, black japanned. **Each**... **$ .65**

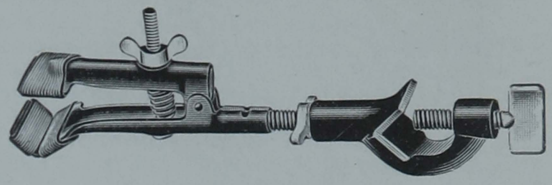
90M14 Clamp Holders. Same as 90M13, except brass, corrosion resistant. **Each**........................... **$1.25**



90M15

90M15 Clamps, Burette. Single. With stamped steel round jaws. Support muff is cast iron with forged brass thumb screw. Length of clamp is adjustable, and jaws rotate to any desired position. Total length, 6⅜ inches; effective jaw opening, ½ to 1¼ inches diameter; muff will take support rods up to ½ inch from side. Complete, with rubber jaw sleeves. **Each**.. **$ .30**

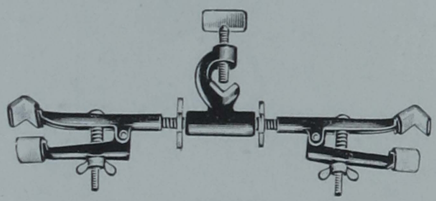
90M16 Clamps, Burette. Same as 90M15, except brass, corrosion resistant. **Each**........................... **$ .50**



90M17

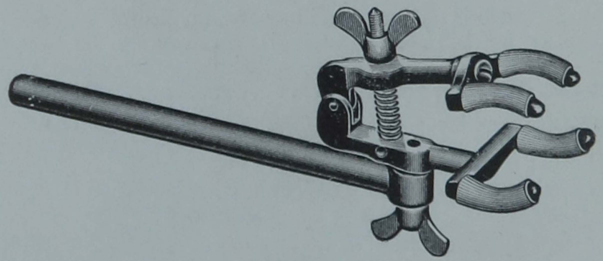
90M17 Clamps, Burette. Single. With stamped steel V-jaws. Support muff is cast iron with forged brass thumb screw. Length of clamp is adjustable, and jaws rotate to any desired position. Total length, 6⅜ inches; effective jaw opening, 3/16 to 1⅜ inches diameter. Muff will take support rods up to ½ inch from the side. Complete with rubber jaw sleeves. **Each**................................... **$ .30**

90M18 Clamps, Burette. Same as 90M17, except of brass, corrosion resistant. **Each**......................... **$ .50**



90M19

90M19 Clamps, Burette, Double. With stamped steel V-jaws. Muff is iron with forged brass thumb screw. Will take rods up to ½ inch. Total length, 9¾ inches; effective jaw opening, 3/16 to 1⅜ inches diameter. Jaws rotate to any desired position. Complete with rubber jaw sleeves. **Each**.. **$ .70**



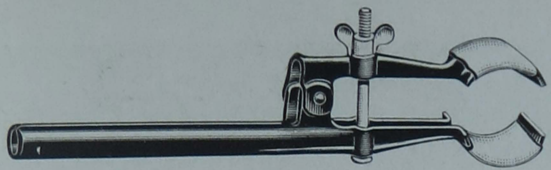
90M20

90M20 Clamps, Universal, Four-Jaw. Self opening. Will hold variety of objects, such as condensers, in any position. Jaws are forked; upper jaws pass between the lower jaws so that very small objects may be gripped. Jaws swing in plane of the stem through 360°. Upper jaws are self aligning. Cast iron, coated with durable baked-on black japan.

Small, for objects up to 2 inches diameter. Stem diameter, 7/16 inch. Length of stem, 5⅛ inches. Total length, 8 inches. **Each**.. **$ .65**

90M21 Clamp, Universal, Four-Jaw. Same as 90M20, except large, for objects up to 2¾ inches diameter. Stem diameter, 7/16 inch. Length of stem, 6 inches. Total length, 9½ inches. **Each**................................ **$ .75**

Clamps, Continued

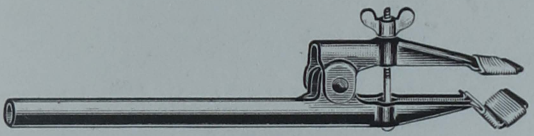


91M1

91M1 Clamps, Bunsen. Small. Extension clamp with stamped steel round jaws. Effective jaw opening ½ to 1¼ inches; total length, 8 inches; stem diameter, ⅜ inch; stem length, 5 inches. Complete with rubber jaw sleeves. **Each**..$ .30

91M2 Clamps, Bunsen. Large. Extension clamp with stamped steel round jaws. Effective jaw opening 1 to 2 inches; total length, 9 inches; stem diameter, ½ inch; stem length, 4½ inches. Complete with rubber jaw sleeves. **Each**..$ .40

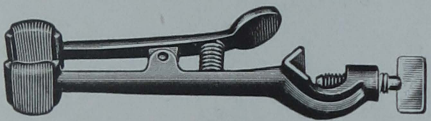
91M3 Clamps, Bunsen. Same as 91M2, except brass, corrosion resistant. **Each**............................$ .65



91M4

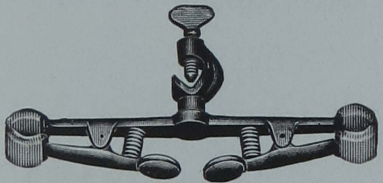
91M4 Clamps, Bunsen. Small. Extension clamp with stamped steel V-jaws and forged brass thumb screws. Black japan finish. Effective jaw opening, 3⁄16 to 1⅜ inches; total length, 8 inches; stem diameter, ⅜ inch; stem length, 5 inches. Complete with rubber jaw sleeves. **Each**............$ .30

91M5 Clamps, Bunsen. Large. Extension clamp with stamped steel V-jaws. Effective jaw opening ⅜ to 2⅜ inches; total length, 9 inches; stem diameter, ½ inch; stem length, 4½ inches. Complete with rubber jaw sleeves. **Each**..$ .40



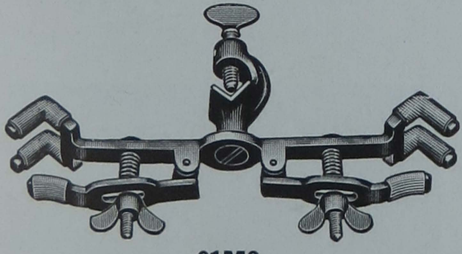
91M6

91M6 Clamps, Burette, Lever Jaw. Cast iron construction. Heavily japanned to withstand rust and corrosion. Forged brass thumb screws and steel compression springs. Jaw openings, ¼ to 1 3⁄16 inches in diameter. Muff will accommodate support rods up to ½ inch diameter slipped in from side, or ⅝ inch diameter if slipped over top of rod. Single lever jaw burette clamp. **Each**..............................$ .35



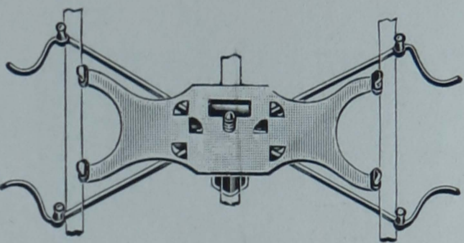
91M7

91M7 Clamps, Burette. Same as 91M6, except double lever jaw. **Each**..$ .55



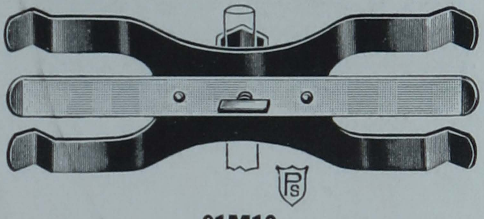
91M8

91M8 Clamps, Burette, Hoffman. With V-shaped jaws for burettes from 5⁄16 to 1 inch diameter. Upper jaws will not obscure graduations. Constructed of cast brass, coated with metallic brass, sprayed on. Brass screws and nuts, bronze springs, forged brass thumb screw. Total length, 7 inches. Muff will accommodate support rods up to ½ inch diameter slipped in from the side, or ⅝ inch diameter if slipped over top of rod. **Each**..............................$1.10



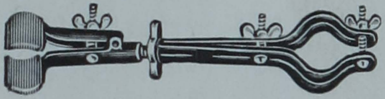
91M9

91M9 Clamps, Burette, Double, Full View. Stamped brass throughout, with a thumb screw rod holder on the front and rubber-covered friction grips for holding the burettes. Over all length, 11 inches; center distance between burettes, 7¾ inches. **Each**....................................$1.50



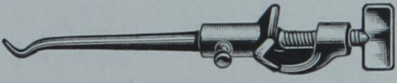
91M10

91M10 Clamps, Burette, Lincoln. Plate fastens to support rods up to ½ inch in diameter. Both plate and socket are stamped steel. Spring clamp and thumb screw are both brass. Center to center distance between burettes, 7⅜ inches; total length of clamp, 8¾ inches; width, 3 inches. Accommodates burettes from ¼ to ⅝ inches; 6 to 16 mm. diameter. **Each**..$ .75

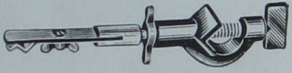


91M11

91M11 Clamps, Automatic Burette. Bottle-neck clamp is stamped from heavy spring brass, bright burnished. Burette jaws are stamped Armco iron, coated with baked-on black japan. Brass screws and wing nuts. Distance between clamp and burette jaw may be varied through ¾ inch; jaws lock at any point and at any angle. Overall length, 9½ inches. Effective opening of burette jaws, ½ to 1¼ inches diameter. Effective opening of clamp jaws, 1 to 1½ inches diameter. **Each**..$ .95



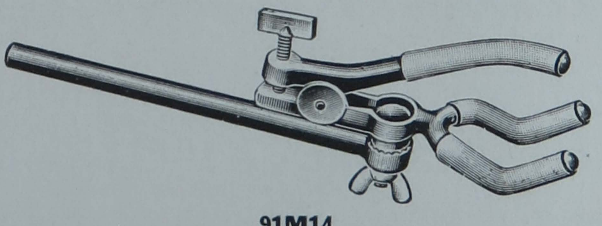
91M12



91M13

91M12 Clamps, Suspension. All parts brass. Muff will accommodate rods up to ½ inch diameter slipped in from side, or ⅝ inch diameter if slipped over top of rod. Maximum distance from center of muff to hook, 4¼ inches; minimum, 3⅞ inches. **Each**..................................$1.00

91M13 Clamps, Thermometer. Clips are spring brass, tightened by wing nut. Extension rod adjustable within the muff shank over ¾ inch. Muff will accommodate rods up to ½ inch diameter slipped in from the side, or ⅝ inch diameter if muff is slipped over top of rod. Maximum distance from clip end to muff, 3½ inches. Nickel plated. **Each**....$1.00



91M14

91M14 Clamps, Universal Extension. Grips objects ranging in size from a thin wire to 2½ inches in diameter, yet perfectly balanced. Extension stem, round, smooth, fastens easily into clamp holders—facilitates mounting in any position. Made of cast brass. Length of stem, 6¾ inches; diameter of stem, ⅜ inch. Overall length, 9¼ inches. **Each**.$1.00

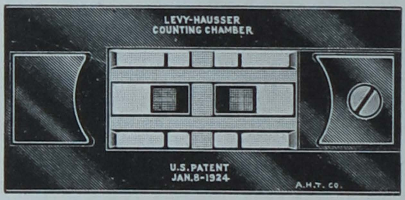
Clinical Laboratory Apparatus

HEMACYTOMETER
WITH LEVY-HAUSSER COUNTING CHAMBER
AND TRENNER PIPETTES
1:200
A.H.T.Co.

92M1

92M1 Haemacytometers, Levy-Hausser. In standard cases of dark green genuine leather, lined with velvet, affording ample protection to the components. Complete with double Levy-Hausser counting chamber with Improved Neubauer ruling, and two original Thoma diluting pipettes, one for red and one for white corpuscles. **Each**................**$17.50**

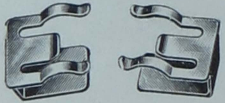
92M2 Haemacytometers. Same as 92M1, except with U. S. Bureau of Standards certification. **Each**...........**$23.50**



92M3

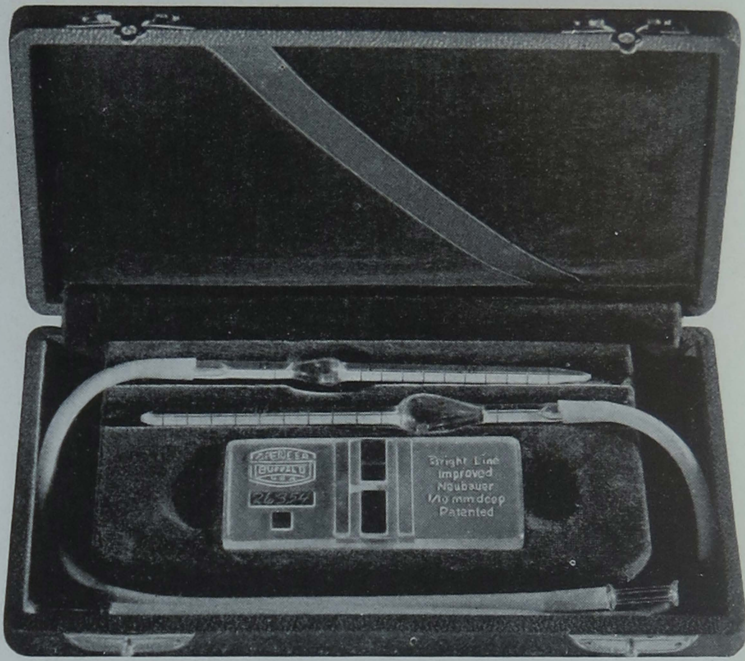
92M3 Levy-Hausser Counting Chamber. With bakelite holder, pair of cover glass clips, ruled glass slide with Improved Neubauer double ruling and two octagonal cover glasses. Without case. **Each**......................**$12.00**

92M4 Levy-Hausser Counting Chamber. Same as 92M3, except with U. S. Bureau of Standards certification for both ruled glass slide and cover glasses. **Each**............**$15.00**



92M5

92M5 Cover Glass Clips. Of German silver. For holding cover glass in position on bakelite holder of Levy-Hausser Counting Chamber. **Pair**...........................**$ .50**



92M9

Haemacytometers, Spencer Bright Line. In use the lines appear white on a dark background—instead of the present opposite of grey lines on a light background. This is due to a metal surface which is fused into the usual glass surface. This increases the visibility of the lines so greatly that the annoyance and trouble of finding and seeing the lines on one of the old type is entirely eliminated.

Due to the difference in surface tension characteristics of the metal surface and a glass surface, the corpuscles are distributed approximately 16% more evenly on the metal surface. This even distribution is important to accurate results.

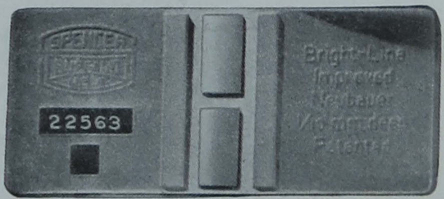
This set has the following advantages:

1. Lines readily visible—no effort required to find them.
2. More even distribution of curpuscles.
3. No need to stop down condenser—lines visible at any opening of the diaphragm.
4. There is a definite improvement in visibility of particles in solution.
5. Eyestrain is greatly decreased—a definite contribution to the comfort of the person making the blood count.

The U. S. Bureau of Standards' requirements are adhered to rigidly.

With double Improved Neubauer ruling, two cover glasses, Thoma diluting pipettes for both red and white corpuscles.

92M6 Complete in cardboard case. **Each**............**$10.50**
92M7 Complete with leatherette case. **Each**........**$12.00**
92M8 Complete with aluminum case. **Each**.........**$12.00**
92M9 Complete with leather case. **Each**............**$13.50**

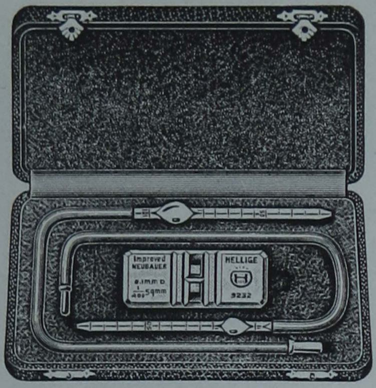


92M10

92M10 Counting Chamber, Spencer Bright Line. With Improved Neubauer ruling. With two cover glasses. **Each**...**$8.00**

Note: Above Spencer haemacytometers and counting chambers with Bureau of Standards certificate. **Extra, $3.00.**

Clinical Laboratory Apparatus, Continued



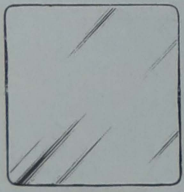
93M1

Haemacytometers, Hellige. Each outfit consists of a counting chamber, with single or double improved Neubauer ruling, with two plano-parallel cover glasses, two Thoma diluting pipettes with 10 inches of pure gum tubing and unbreakable mouthpieces (one each pipette for red and white corpuscles), and velvet-lined, leatherette-covered standard case.

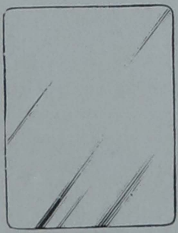
No.	Ruling	Counting Chamber Certification	Diluting Pipette Certification	**Each**
93M1	Single	Hellige	Hellige	**$9.30**
93M2	Single	Nat'l. B. of S.	Nat'l. B. of S.	**14.30**
93M3	Single	Hellige	Triple Test	**9.90**
93M4	Single	Nat'l B. of S.	Triple Test	**11.90**
93M5	Double	Hellige	Hellige	**10.30**
93M6	Double	Nat'l. B. of S.	Nat'l. B. of S.	**15.80**
93M7	Double	Hellige	Triple Test	**10.90**
93M8	Double	Nat'l. B. of S.	Triple Test	**13.40**

Haemacytometer Counting Chambers. One-piece construction of a specially selected hard glass. Trenches and ruling surfaces are of the proper depth and width to prevent flooding of the cover glass supporting surfaces. Rulings are deeply engraved. Two plano-parallel cover glasses included with each chamber.

No.	Ruling	Chamber Depth mm.	Certification	**Each**
93M9	Improved Neubauer, single	0.1	Hellige	**$6.00**
93M10	Improved Neubauer, single	0.1	N.B. of S.	**8.00**
93M11	Improved Neubauer, double	0.1	Hellige	**7.00**
93M12	Improved Neubauer, double	0.1	N.B. of S.	**9.50**
93M13	Thoma, single	0.02	Hellige	**8.00**
93M14	Thoma, single	0.1	Hellige	**8.00**
93M15	Fuchs-Rosenthal, single	0.2	Hellige	**7.00**
93M16	Fuchs-Rosenthal, single	0.2	N.B. of S.	**9.00**



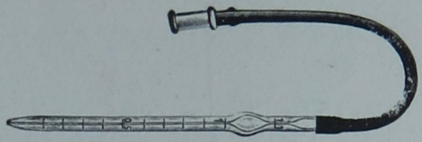
93M17



93M18

93M17 Cover Glasses. Selected grade. For single counting chamber. Size, 20x21 mm. Thickness, 0.4 mm. **Each** . $ **.40**

93M18 Cover Glasses. Selected grade. For double counting chamber. Size, 20x26 mm. Thickness, 0.4 mm. **Each** . $ **.40**

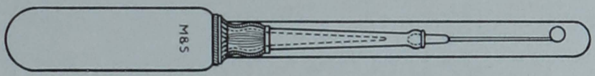


93M19

93M19 Blood Diluting Pipettes, Thoma. For white corpuscles. Diluting ratio, 1 to 10 and 1 to 20—with 10 inches of tubing and white mouthpiece. **Each** . . . . **$ .85**

93M20 Blood Diluting Pipettes, Thoma. Same as 93M19, except for red corpuscles. Diluting ratio 1 to 100 and 1 to 200—with 10 inches of tubing and red mouthpiece. **Each** . . . . **$ .85**

93M21 Rubber Tubing for Blood Pipettes. 3 mm. bore; 1 mm. wall. **Per Foot** . . . . **$ .10**

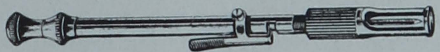


93M22

93M22 Blood Collecting Tubes, Vacuum, Keidel. Consists of a 6 ml. plain vacuum tube, connected by rubber tubing to a 25 gauge needle, with glass cover for protection. **Each, $ .20. Dozen** **$2.00**

93M23 Blood Collecting Tubes, Vacuum, Keidel. 10 ml. capacity. Contains potassium oxalate as a preservative. **Each, $ .25. Dozen** **$2.50**

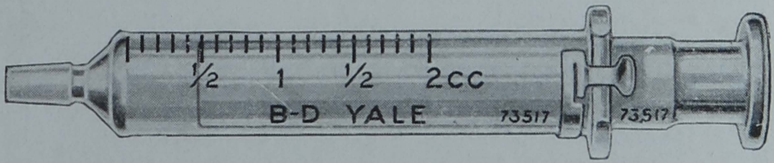
93M24 Mailing Cases for Keidel Tubes. Strongly made; round, of heavy cardboard, with metal ends and metal screw caps. **Dozen** . . . . **$ .75**



93M25

93M25 Blood Lancets. With flat, sharpened point, heavily nickel plated case and screw adjustment of protecting sleeve providing variable depth of penetration. Length over all, 110 mm. **Each** **$1.50**

93M26 Blood Capillary Glass Tubing. For coagulation. 3¾ inches long. **Bundle of 50** . . . . **$ .25**



93M27

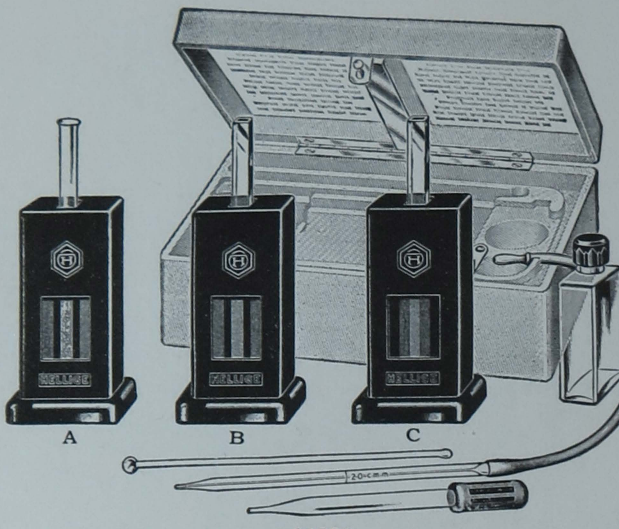
93M27 Syringes, B-D Yale. Of special lime-free glass. Will withstand continuous use and repeated sterilization. Strong glass flange assures a good grip and prevents the syringe from rolling. Without needles, in carton.

Capacity, ml.	**1½**	**2**	**5**	**10**	**20**	**30**	**50**
Graduated, ml.	⅒	⅒	⅕	⅕	1	1	5
Each	**$1.00**	**1.25**	**2.00**	**2.50**	**3.00**	**4.00**	**6.00**

93M28 Syringes. Same as 93M27, except with two stainless steel "Erusto" needles. In Bakelite case.

Capacity, ml.	1½	2	5	10	20	30	50
Each	**$1.45**	**1.70**	**2.50**	**3.00**	**3.50**	**4.75**	**6.75**

Clinical Laboratory Apparatus, Continued



94M1

Haemometers, Hellige. For the determination of acid hematin after dilution of blood with hydrochloric acid. The housings are molded Textolite. As this material is practically unbreakable and is not affected by the acid used in the test or by laboratory fumes, the housings will always retain their fine appearance and will last indefinitely. Glassware has been improved, in that a more practical dropping pipette with rubber nipple and a heavier acid bottle with bakelite screw cap is supplied, instead of the customary "filling tube" and easily breakable vial. Complete apparatus is supplied in a strong wooden case. Outside is handsomely polished and the inside is provided with compartments for the individual components.

94M1 Haemometers, Hellige. With two color rod standards. Consists of haemometer housing as described above; round measuring tube (Wintrobe), with gram and percent scales; 20 cmm. (0.02 ml.) pipette, with 10 inches of pure rubber tubing and unbreakable mouthpiece; dropping pipette; glass stirring rod; and bottle with bakelite screw cap for hydrochloric acid. Complete in wooden case. **Each**..**$9.00**

94M2 Haemometers, Hellige. Same as 94M1, except with round measuring tube with scales for reading "Sahli units" and percentage values. **Each**......................**$9.00**

94M3 Haemometers, Hellige. With two precision color plate standards. Consists of haemometer housing and square measuring tube, Wintrobe; 20 cmm. (0.02 ml.) pipette, with 10 inches of pure rubber tubing and unbreakable mouthpiece; dropping pipette; glass stirring rod; and bottle with bakelite screw cap for hydrochloric acid. Complete in wooden case. **Each**..**$12.00**

94M4 Haemometers, Hellige. Same as 94M3, except with square measuring tube, with scales for reading "Sahli units" and percentage values. **Each**.....................**$12.00**

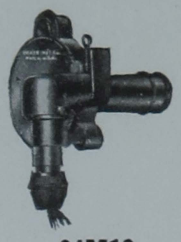
94M5 Haemometers, Hellige. With two prismatic color standards. Consists of haemometer housing and square measuring tube, Wintrobe; 20 cmm. (0.02 ml.) pipette with 10 inches of pure rubber tubing and unbreakable mouthpiece; dropping pipette; glass stirring rod; and bottle with bakelite screw cap for hydrochloric acid. Complete in wooden case. **Each** **$14.00**

94M6 Haemometers, Hellige. Same as 94M5, except with square measuring tube with scales for reading "Sahli units" and percentage values. **Each**.....................**$14.00**

94M7 Measuring Tubes, Hellige, Square. With two scales; a white scale for reading "Sahli units" and a red scale for percentage values, which are based on 80 "Sahli units" (=17 grams haemoglobin in 100 ml. of blood) as the equivalent of 100%. **Each**.................................**$2.70**

94M8 Measuring Tubes, Wintrobe. With two scales; a yellow scale for reading grams of haemoglobin and a red scale for percentage values, which are based on 14.5 grams of haemoglobin in 100 ml. of blood as the equivalent of 100%. **Each**..**$2.70**

94M9 Pipettes. For above haemometers. Graduated at 20 cmm. (0.02 ml.); with 10 inches of pure rubber tubing and unbreakable mouthpiece. **Each**....................**$ .75**



94M10

94M15

Haemoglobinometers, Dare. For determining the grams or percentage of haemoglobin in undiluted blood. Re-standardized so that normal equals 16 grams per 100 ml. Has gram scale checked against the Van Slyke oxygen capacity method. The depth of the capillary blood film in the pipette is 0.007 inches within a tolerance of ±0.0003 inch.

94M10 Haemoglobinometers, Electric Illuminated, Dare. With resistance unit to screw into any lamp socket, A. C. or D. C., 110 volts. With cord, lamp, camera and connectors ready for use, and candle attachment. **Each**........**$39.00**

94M11 Haemoglobinometers, Dare. Same as 94M10, except with rhomboid prisms for bringing the fields into juxtaposition. **Each**..............................**$45.00**

94M12 Special Lamps. For 94M10 and 94M11. **Each**. **$ .35**

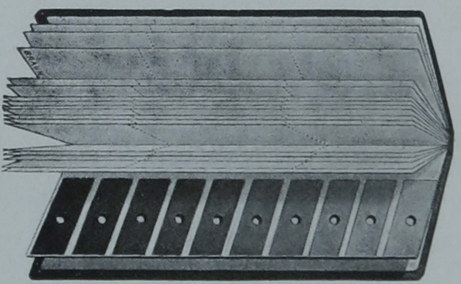
94M13 Automatic Pipettes. Each...............**$1.50**

94M14 Clear Glass of Pipette. Optically plano. **Each**. **$ .50**

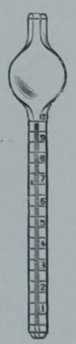
94M15 Haemoglobinometers, Dare. Complete with Universal battery handle. **Each**.....................**$39.00**

94M16 Haemoglobinometer Battery Handles. For 94M15 **Each**...**$10.00**

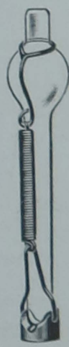
94M17 Haemoglobinometer Batteries. For 94M15. **Each**...**$ .30**



94M18



94M19



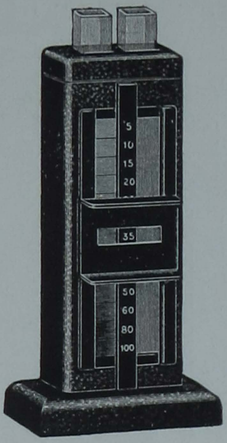
94M20

94M18 Haemoglobinometer Scales, Tallquist. For making bedside tests of haemoglobin and blood. Consists of a bound book of convenient shape for carrying in pocket or bag. With color scale consisting of 10 shades representing haemoglobin percentage from 10 to 100% of normal located in the rear of the book. The remainder of the book consists of absorbent paper perforated to facilitate removal in squares of convenient size. Sufficient for making 150 tests. **Each**...**$ .90**

94M19 Haematocrit Tubes, Van Allen. For the volumetric estimation of the relation between the blood corpuscles and the plasma by the finger puncture method. Consists of a capillary tube with a bulb near the top. Total length of the tube is about 100 mm. and the stem below the bulb is graduated in 100 parts, with every tenth line numbered. Without rubber sealing band or rubber suction tube. **Each**..**$1.50**

94M20 Spring Sealing Clips. Consists of a metal ring and rubber cushioned cup which are connected by a steel spring to hold the cup in position on the end of the tube. Used on 94M19. **Each**...................................**$1.25**

Clinical Laboratory Apparatus, Continued

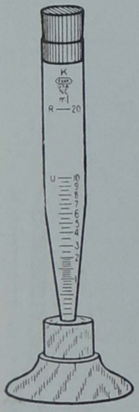


95M1

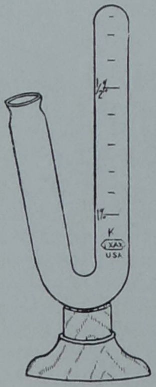
95M1 Colorimeters, Hellige-Dunning. For estimating the amount of pthalein excreted in the Rowntree and Geraghty Phenolsulphonphthalein Renal Test. With series of 13 non-fading permanent glass color squares representing the percentage of excreted phenolsulphonphthalein in steps of 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 80 and 100%, respectively. Complete with two square specimen tubes. **Each**....**$15.00**

95M2 Specimen Tubes Only, Square. Each.......**$1.50**

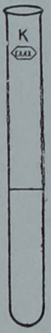
95M3 Phenolsulphonphthalein Solution. Sterile, biologically standardized solution (6 mg. dye in 1 cc.) in ampoules. **Box of 10 ampoules**..............................**$1.50**



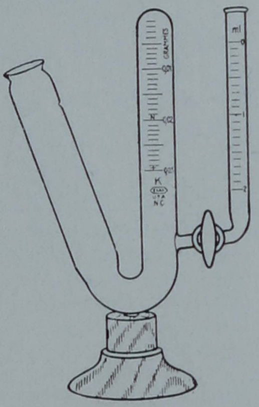
95M4



95M5



95M6



95M7

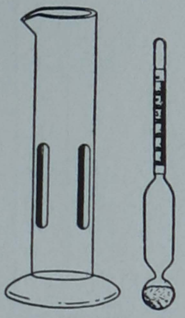
95M4 Albuminometers, Exax Blue Line. For quantitative determination of albumin in urine by the Esbach or Pfeiffer methods. Complete with rubber stopper, detachable wooden base and wooden case, and directions. **Each**........**$1.25**

95M5 Saccarometers, Exax Blue Line, Einhorn. Graduated 0 to 1% in 1/10%. With detachable wooden base. Set consists of two saccharometers and one test tube graduated at 10 ml. **Each**....................................**$2.50**

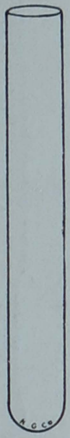
95M6 Test Tubes, Exax Blue Line. Graduated at 10 ml. For use with 95M5. **Each**.........................**$ .20**

95M7 Ureometers, Exax Blue Line, Hinds-Doremus. Fermentation tube is graduated to .03 grams or urea per ml. of urine in .001 gram subdivisions. Side tube is graduated from 0 to 2 ml. in 1/10 ml. Ureometer is furnished with a detachable wooden base, and is packed in an individual set-up box. **Each**..................................**$2.50**

95M8



95M10



95M13

95M8 Urine Specimen Bottles. Capacity, 7 ounces. With caps. **Dozen, $1.00. Gross**......................**$10.00**

95M9 Caps. For bottles, 95M8. **Hundred**..........**$ .15**

95M10 Urinometers, Squibbs. With mercury filled hydrometers and fluted wall jar. Packed in individual cartons. **Each**..**$1.20**

95M11 Jars, Only. For 95M10. With fluted wall and pour-out. Packed in individual cartons. **Each**............**$ .34**

95M12 Hydrometers, Only. For 95M10. Mercury filled. Packed in individual cartons. **Each**................**$ .90**

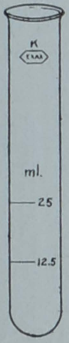
95M13 Urea Tubes. For Van Slyke and Cullen urea apparatus. Diameter, inside, 28 mm.; length, 200 mm. Fits a No. 6, two-hole rubber stopper. **Each**....................**$ .25**

95M14

95M15

ml
20
15
10
4
1

95M16



95M17

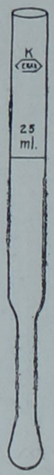
95M14 Outlet Aeration Tubes. For Van Slyke and Cullen urea apparatus. Length, 150 mm. With bulb in center, 15 mm. in diameter by 75 mm. long. **Each**............**$ .15**

95M15 Inlet Aeration Tubes. For Van Slyke and Cullen urea apparatus. Length, 300 mm.; diameter, 6 mm. With bulb at one end, 10 mm. in diameter, which is perforated with small holes. **Each**..................................**$ .20**

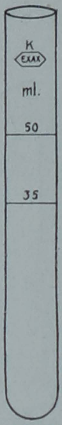
95M16 Blood Sugar Test Tubes, Exax Blue Line. Gradwohl-Blavias. Graduated at 1, 4, 10, 15 and 20 ml. Heavy wall, without lip. Length, 150 mm.; diameter, 18 mm. **Each, $ .30. Dozen**..........................**$3.24**

95M17 Blood Sugar Test Tubes, Exax Blue Line. Lewis-Benedict. Graduated at 12.5 and 25 ml. Heavy wall with slight lip. **Each, $ .35. Dozen**..................**$3.78**

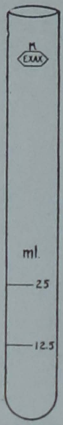
Clinical Laboratory Apparatus, Continued



96M1



96M3



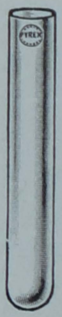
96M4

96M1 Blood Sugar Test Tubes, Exax Blue Line, Folin. Graduated at 25 ml. with a bulb of such capacity that the surface of the alkaline mixture of sugar and copper falls in the lower half of the parallel constriction.
Each, $ .40. Dozen, $4.32. Case of 36........... **$11.52**

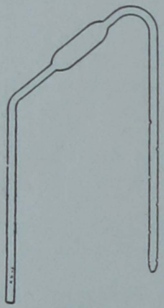
96M2 Blood Sugar Test Tubes, Exax Blue Line, Folin. Same as 96M1, except graduated at 12.5 and 25 ml.
Each, $ .50. Dozen, $5.40. Case of 36........... **$14.40**

96M3 Digestion Test Tubes, Exax Blue Line, Folin. Graduated at 35 and 50 ml.; diameter, 26 mm.; length, 200 mm.
Each, $ .60. Dozen, $6.48. Case of 36........... **$17.28**

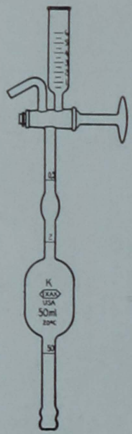
96M4 Receiving Test Tubes, Digestion, Exax Blue Line, Folin. Graduated at 12.5 and 25 ml. For use in urease decomposition and distillation by the micro-Kjeldahl method.
Each, $ .40. Dozen, $4.32. Case of 36........... **$11.52**



96M5



96M6

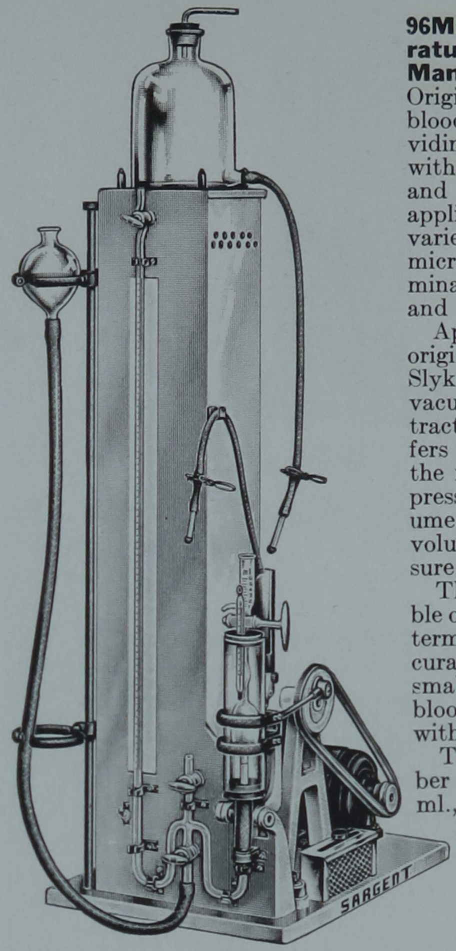


96M7

96M5 Urea Test Tubes, Pyrex. With heavy wall. Used in the Van Slyke-Cullen method of urea determination. Diameter, outside, 32 mm.; total length, 200 mm.
Each, $ .35. Case of 48........................ **$15.12**

96M6 Distilling Tubes. Watson and White. For use in distilling over ammonia in the Folin-Wu method for the determination of urea in blood.
Each, $1.25. Case of 12........................ **$13.50**

96M7 Burettes, Exax Blue Line. For Van Slyke Manometric Apparatus. Latest modification. Provided with certificate showing the actual volumes. Burettes are accurate within ±0.003 ml. at the 0.5 ml. line, and within ±0.005 ml. at the 2.0 ml. line.
Each, $15.00. Case of 6........................ **$72.00**



96M8

96M8 Blood Gas Apparatus, Van Slyke-Neill, Manometric, Sargent. Originally developed for blood gas analysis providing greater accuracy with smaller samples, and since successfully applied to an extensive variety of quantitative micro biochemical determinations in blood, urine and body fluids.

Apparatus resembles original volumetric Van Slyke apparatus in its vacuum method of extracting gases, but differs from the latter in the measurement of gas pressure at constant volume, rather than of gas volume, at constant pressure.

This method is capable of micro-chemical determinations of good accuracy using samples as small as 0.2 ml. and of blood gas determinations with 1 ml.

The extraction chamber has a volume of 50 ml., with graduations at 0.5 and 2.0 ml., representing alternate volumes to which the gas is adjusted for pressure measurement.

To assure the maximum precision permitted by this method, extraction chambers are very carefully calibrated and guaranteed accurate within ±0.003 ml. at the 0.5 ml. mark and ±0.005 at the 2.0 ml. mark. A certificate is supplied with each chamber showing absolute corrections at each graduation point.

The apparatus has many improved mechanical features, the most important of which, and the one greatly appreciated by operators, is the correctly aligning pivoted carriage for the extraction chamber. This construction is responsible both for the silence and smoothness of operation in this machine and for a definite reduction in the breakage of glassware.

It is portable and equipped with rubber suction feet; supplied complete with rubber connections of high-grade pure gum, nitrometer tubing; manometer, which has a bore between 4 and 5 mm., is graduated from 0 to 650 mm., and provided with a stopcock at the top with a constriction below; 250 ml. leveling bulb; 32 ounce suction bottle; 2 liter water supply bottle; lamps; tubing clamps; one pipette, calibrated to deliver 0.2 ml.; one each, pipettes with stopcocks calibrated to deliver 1, 2, 3 and 5 ml. respectively; water jacket; engraved stem thermometer, 5 inches long, range 10° to 45° C. in intervals of 1°; and cord and plug for attachment to standard outlets. For operation on 110 volt A. C., 60 cycle circuits.
Each.. **$150.00**

96M9 Blood Gas Apparatus, Extraction Chamber Only. Without water jacket. With certificate of calibration showing absolute corrections. **Each**...................... **$17.50**

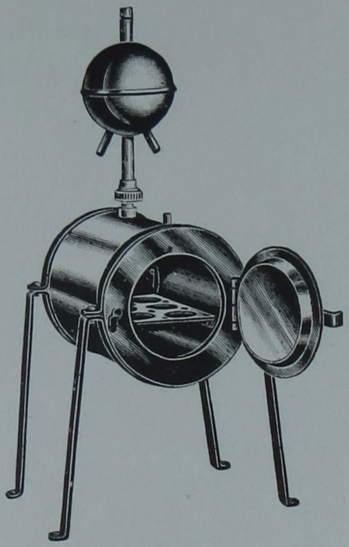
96M10 Blood Gas Apparatus, Extraction Chamber Only. Pyrex. Same as 96M9, except of Pyrex glass. **Each**. . **$19.00**

96M11 Water Jackets, Only. For 96M9. Without stoppers.
Each.. **$ .90**

96M12 Water Jackets, Only, Pyrex. Same as 96M11, except of Pyrex glass. **Each**...................... **$ 1.00**

96M13 Manometers, Only. For 96M8. With connecting system and 3 stopcocks. Graduated 0 to 650 mm.
Each.. **$21.00**

Coal Apparatus



97M1

97M1 Coal Moisture Ovens. A. S. T. M. D-271, U. S. Bureau of Mines, Technical Paper Number 8, U. S. Bureau of Mines Bulletin Number 129, Gas Chemists' Handbook, Third Edition, "Sampling and Analysis of Coal, Coke and By-Products"—U. S. Steel Corporation.

For determination of residual moisture in coal and coke, by air drying the sample. Where many samples are to be dried, this oven will be found highly convenient. With a minimum of air space, it maintains a uniform temperature in all parts of the drying chamber.

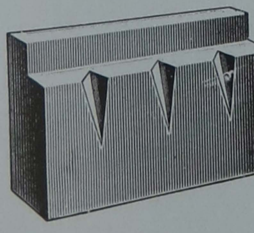
The double walled copper cylinder is equipped with a double walled door and a removable copper shelf, perforated to hold six capsules for retaining the samples. (Capsules are not included.) The annular jacket formed by the double walls is generally filled with a solution of glycerine and water, having a specific gravity 1.19 at 15° C. A temperature of 105° for drying coal samples is maintained by the circulating solution, which is kept at its original concentration by a reflux condenser.

A current of air, dried by passing through concentrated sulphuric acid and preheated in a copper tube encircling the oven between the walls, may be forced through the drying chamber and over the samples at a rate sufficient to change the total volume of air two to four times per minute. On passing through the oven, the air current absorbs moisture from the samples. A thermometer well communicates with the drying chamber. Removable japanned iron support stand is included. Dimensions: Drying chamber, length, 7½ inches; diameter, 4¼ inches; jacket, outside, length, 8½ inches; diameter, 6¼ inches; shelf perforations, diameter, 1½ inches; support, height, 12 inches. **Gas heated. Each** . **$39.50**

97M2 Coal Moisture Ovens. Same as 97M1, except electrically heated. For 110 volts. **Each** **$75.00**

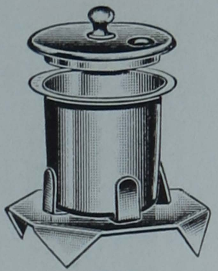
97M3 Coal Moisture Ovens. Same as 97M2, except for 220 volts. **Each** **$75.00**

Capsules and Covers. For moisture determinations. See page 68.



97M4

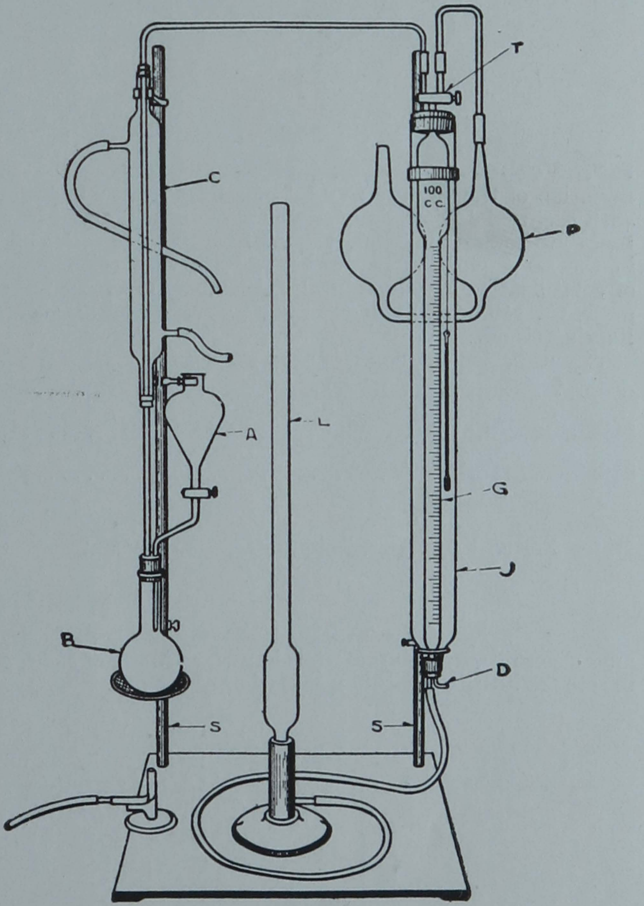
97M4 Cone Molds. Solid brass. For making three ash cones used in the determination of fusibility of ash. Cones formed measure ¾ inches high and ¼ inches at each side of the base. **Each** **$6.00**



97M5

97M5 Crucibles, Pennock and Martin. For rapid, accurate determinations of sulphur in coal and coke by the Sundstrom method. The crucible is seamless, of heavy sheet nickel, highly polished outside, sanded bright inside, with flanged rim to accommodate the cover. Cover is heavy nickel plated steel, with lower surface shouldered for centering on the crucible, and with hole to permit insertion of an ignition wire. Sheet aluminum removable base. Crucible capacity, 40 ml. Inside diameter, 1½ inches (38 mm.). Depth, 1⅝ inches (40 mm.). **Complete** **$2.20**

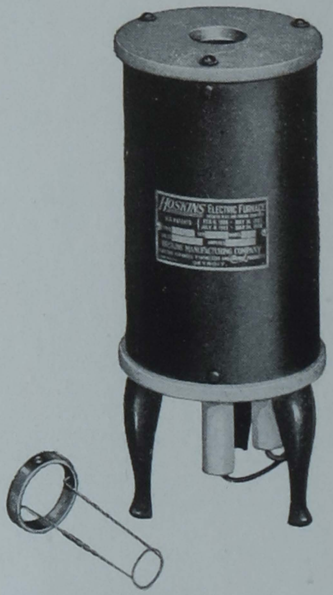
97M6 Crucibles, Only. Without cover or base. **Each** . **$1.25**



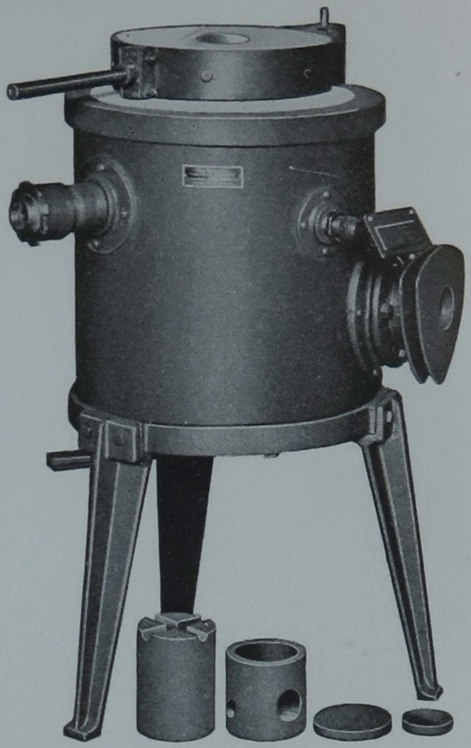
97M7

97M7 Carbon Apparatus, Parr's. For determination of total carbon in coal, coke, petroleum oils, etc., and in the organic matter in soils, in conjunction with the Parr Calorimeter. The residue from the B. t. u. determination (or from the sulphur test in the Parr Sulphur Bomb) which has the carbon from the sample combined in the form of sodium carbonate, is treated with acid, and the volume of the liberated CO_2 is accurately measured. Apparatus consists of a reaction flask, addition funnel, condenser, absorption pipette and a 100 ml. gas measuring burette enclosed in a water jacket and fitted with leveling tube. Complete on support with clamps, rubber stoppers, and tubing and special burner for artificial gas of heat value approximately 600 B. t. u's. Outfit complete as illustrated, with directions and tables. **Each** **$52.00**

Coal Apparatus, Continued



98M1



98M4

98M1 Furnaces, Electric, Fieldner. For use in the determination of the volatile content of coal. Furnace is equipped with a chromel wire sling, in which the crucible and its contents are mounted. Thus, the coal sample is always placed in the same position in the furnace, so that the conditions of volatilization may be exactly duplicated. Operates on A. C. or D. C., 110 or 220 volts and can be connected directly to a lighting circuit.

The heating chamber is 1½ inches diameter by 6 inches deep. Without rheostat. **Each**..................... **$40.00**

98M2 Heating Units. (One required.) **Each**........ **$8.50**

98M3 Rheostats. Each.......................... **$13.75**

Note: For coal sulphur turbidimeter, see page 366.

98M4 Furnaces, Coal Ash Melting Point Outfit. A. S. T. M. D-271. Lining is made from a high grade refractory having a fusion temperature of 3400° F. The gas burner supplied with the furnace can be used either with fan or with positive pressure blower. Observation and pyrometer holes are provided. Floor space, 21x24 inches. Height above floor, 31 inches. Gas line with burner for a fan, 1 inch. Gas line with burner for a positive pressure blower, ¾ inch. Air line with burner for a fan, 2 inches. Air line with burner for positive pressure blower, 1½ inches. Shipping weight, 350 pounds. Complete, including two sillimanite crucibles, crucible covers and one brass cone mold, but without pyrometer or blower. **Each**... **$90.00**

98M5 Sillimanite Crucibles. Set of 2.............. **$4.00**

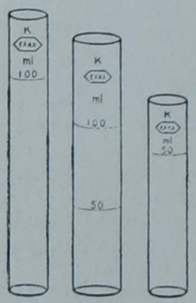
98M6 Sillimanite Crucible Covers. Each.......... **$ .30**

98M7 Sillimanite Discs. Each.................... **$ .20**

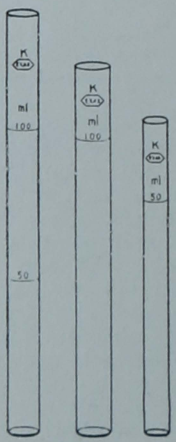
Color Comparison Tubes

Color Comparison Tubes, Exax Quality, Nessler, Low Form. With white line graduations. For determination of the amount of nitrogenous materials in water. Made of clear, colorless glass with polished bottoms. Graduated height of tubes supplied in sets are identical within a variation of 5 mm.

Size	**1**	**2**	**3**
Graduated at ml	50	100	50-100
Height, overall, mm	175	200	200
Diameter, outside, mm	25	32	32
Quantity in case	36	36	36
98M8 Single Tubes. Each	**$ .60**	**.70**	**.80**
98M9 Matched Tubes. Sets of 6. **Set**	**$ 4.50**	**5.25**	**6.00**
98M10 Unmatched Tubes. Case	**$17.28**	**20.16**	**23.04**
98M11 Matched Tubes. Sets of 6. **Case**	**$21.60**	**25.20**	**28.80**



98M8

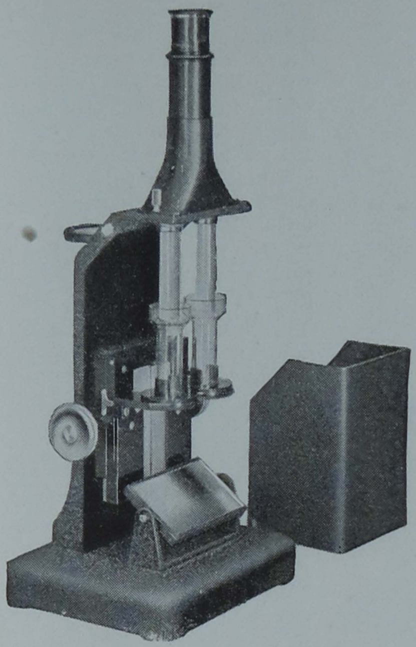


98M12

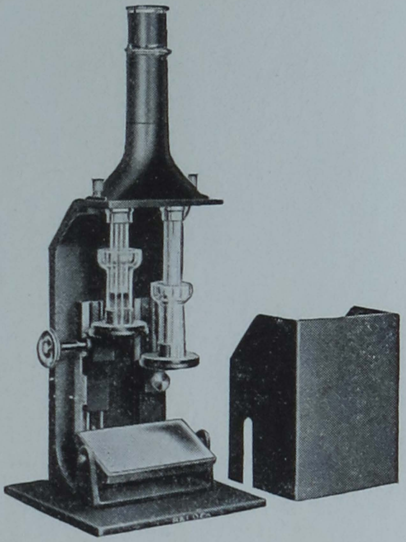
Color Comparison Tubes, Exax Quality, Nessler, Tall Form. With white line graduations. A. P. H. A. standard. With improved shadowless bottoms. Graduated heights of tubes in sets are identical within a variation of 1½ mm. for 50 ml. tubes and 2 mm. for 100 ml. tubes.

Size	**1**	**2**	**3**
Graduated at ml	50	100	50-100
Height, overall, mm	300	375	375
Diameter, outside, mm	21	24	24
Quantity in case	36	36	36
98M12 Single Tubes. Each	**.60**	**.70**	**.80**
98M13 Matched Tubes. Sets of 6. **Set**	**$ 4.50**	**5.25**	**6.00**
98M14 Unmatched Tubes. Case	**$17.28**	**20.16**	**23.04**
98M15 Matched Tubes. Sets of 6. **Case**	**$21.60**	**25.20**	**28.80**

Colorimeters



99M1



99M18

Colorimeters, Bausch & Lomb. Designed for measuring the contents of a solution by the intensity of coloration of transmitted light through a comparison of standard or known liquids. Colorimetric analysis of a compound may be made in all cases in which it is possible to obtain a liquid having a color sufficiently stable to last during the measurement. Light from some even source of illumination is passed through the two sides of the instrument. There are interposed in these two light paths the substances which are to be tested. Some of the light in passing through the liquids is absorbed, the amount of absorption depending on the depth of the solution. The two beams of light are now brought to a common axis by means of rhombohedral prisms.

Light from one cup illuminates one-half of a circular field and light from the other cup illuminates the other half. The observing microscope, by which the observer sees both fields with one eye, is focused on the line of separation of the two fields. It is now possible to alter the depths of the two columns of liquid until the two halves of the field are identical in intensity. When this condition holds, the concentrations of the two solutions are inversely proportional to the depths which are read on the scales at the side of the instrument.

99M1 Colorimeters, Duboscq 50 mm. With all glass cups, solid cylindrical plungers and scale reading device. In case. **Each**.......... **$125.00**

99M2 Colorimeters, Duboscq 50 mm. With separable cups with plano-parallel glass bottoms, solid cylindrical plungers and scale reading device. In case. **Each**.......... **$125.00**

Replacement Parts

99M3 Cups, Separable, 50 mm. Depth, 56 mm. Complete. **Each**.......... **$5.50**

99M4 Cylinder Glasses, Only. 50 mm. **Each**.......... **$1.65**

99M5 Bottom Glasses. Diameter, 25.8 mm. Optically inactive. **Each**.......... **$ .35**

99M6 Washers, Rubber. Diameter, 38 mm. **Each**... **$ .05**

99M7 Plungers. Solid glass, 50 mm. With threaded adapter. **Each**.......... **$7.50**

99M8 Mirrors. Double faced; in mounting. **Each**.... **$4.00**

99M9 Cups, All Glass Fused. With flare tops and fused bottoms (depth, 56 mm.). **Each**.......... **$4.50**

99M10 Cup Holders. Pair.......... **$4.00**

99M11 Colorimeters, Duboscq, 100 mm. With separable cups, solid plungers, double faced mirror and both cup carriers adjustable by rack and pinion. In case. **Each**...... **$165.00**

Replacement Parts

99M12 Cups, Separable, 100 mm. Depth, 105.5 mm. **Complete**.......... **$8.00**

99M13 Cylinder Glasses, Only, 100 mm. **Each**..... **$1.85**

99M14 Bottom Glasses. Diameter, 25.8 mm. Optically inactive. **Each**.......... **$ .35**

99M15 Washers, Rubber. Diameter, 28 mm. **Each**.. **$ .05**

99M16 Plungers. Solid glass, 100 mm. With threaded adapter. **Each**.......... **$10.00**

99M17 Mirrors. Double faced; in mounting. **Each**... **$4.00**

99M18 Colorimeters, Biological, 40 mm. With both cup carriers adjustable, one by rack and pinion. With separable cups; solid cylindrical plungers. No case. **Each**...... **$65.00**

99M19 Colorimeters, Biological. Same as 99M18, except with direct reading scale and both cup carriers adjustable by rack and pinion. **Each**.......... **$90.00**

Replacement Parts

99M20 Cups. Separable, 40 mm. Depth, 46.5 mm. **Complete**.......... **$5.00**

99M21 Cylinder Glasses, Only. Each.......... **$1.50**

99M22 Bottom Glasses. Diameter, 25.8 mm. Optically inactive. **Each**.......... **$ .35**

99M23 Washers, Rubber. Diameter, 28 mm. **Each**.. **$ .05**

99M24 Plungers. Solid glass, 40 mm. With threaded adapter. **Each**.......... **$5.50**

99M25 Colorimeters, Biological, 40 mm. One cup adjustable by rack and pinion. With solid glass plunger, one piece all glass flare top cups and cup holders. No case. **Each $65.00**

99M26 Colorimeters, Biological. Same as 99M25, except with direct reading scale and both cup carriers adjustable by rack and pinion. **Each**.......... **$90.00**

Replacement Parts

99M27 Cups. All glass, 40 mm. With flare tops and fused bottoms. (Depth, 47.5 mm.). **Each**.......... **$4.00**

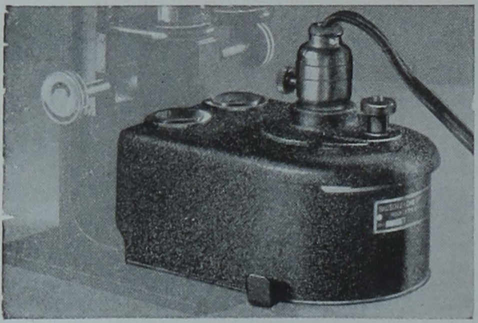
99M28 Plungers. Solid glass, 40 mm. With threaded adapter. **Each**.......... **$5.50**

99M29 Cup Holders. For all glass cups. **Pair**........ **$4.00**

99M30. Mirrors. Double faced; in mounting. **Each**.. **$4.00**

99M31 Carrying Cases. For above biological colorimeters. **Each**.......... **$5.00**

Colorimeters, Continued



100M1

100M1 Colorimeter Lamps, B. & L. Can be attached direct to the base of any Bausch and Lomb colorimeter and provides two degrees of light intensity with a single light source. Gives evenly balanced illumination with a single 15-watt, 110-volt bulb. Heat is reduced to a minimum in the well ventilated case constructed to prevent hot air currents rising in the operator's face during use.

The interior of the case is finished in dull white lacquer which acts as an integrator and provides light of a near daylight quality. A built-in biplane reflector at one end reflects the integrated light with equal intensity through two clear glass windows in the top of the case.

The bulb, socket and switch are all mounted on a movable cover plate which is clamped in position by a thumb screw.

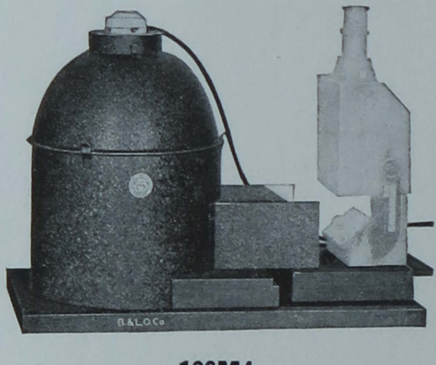
The two degrees of light intensity, one for deeply colored, and one for lightly colored liquids, are made through a swing-out diaphragm operated by a lever projecting from the base of the housing.

The two intensities possible with this lamp cover all ranges of colorimetric work.

Complete, with blue glass filter, bulb and 6 feet of cord, with switch and attachment plug. **Each**............**$13.50**

100M2 Bulbs. 15-watt, 110-volt Mazda. **Each**.......**$ .55**

100M3 Resistances. For use on 220-volt A. C. or D. C. **Each**...**$4.25**



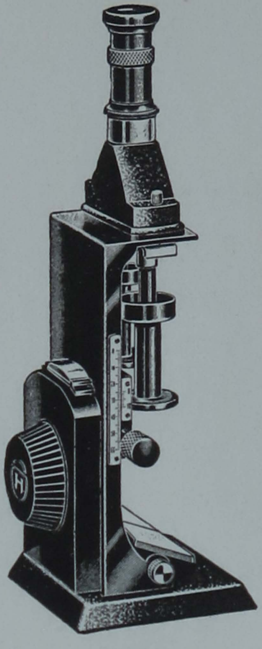
100M4

100M4 Colorimeter Lamps, B. & L. Produces a very complete diffusion of reflected light over the entire surface of the colorimeter mirror. Interchangeable blocks permit the use of instruments of different sizes.

Within the dome-shaped top, and out of direct line with the mirror of the colorimeter, is a 60-watt Mazda bulb. The light rays are diffusely reflected into the mirror from a wedge-shaped or double concave septum in the lower part of the housing. The unpolished white surface of this curved dividing wall provides illumination that is practically white, evenly diffused and of uniform intensity. A blue glass filter, to be inserted in the eyepiece of the colorimeter to change the light to approximate daylight is included.

Complete, with set of blocks to accommodate several sizes of bases, 60-watt, 120-volt Mazda bulb, blue glass filter, 15 feet of cord, snap switch and attachment plug. **Each**..**$22.50**

100M5 Bulbs. 60-watt, 120-volt Mazda. **Each**.......**$ .15**



100M6

100M6 Colorimeters, Hellige Duboscq, Direct Reading Drum Scale. Consists of a cast iron base carrying an upright of heavy construction which insures stability and perfect alignment. Mounted to the upright are twin mirrors, the rack and pinion mechanism with stages for the cups, the translucent scale drum with its operating knob, and the upper platform for holding the plungers, prism housing, and observing microscope.

The outstanding feature of this colorimeter is a direct reading scale, engraved on the periphery of a translucent drum of 80 mm. diameter, a 250-mm. circumference. This permits a five-fold magnification of the usual scale, allowing it to be graduated in fifths of a millimeter, with tenths easily interpolated and twentieths of a millimeter judged with fair accuracy. **Complete** with direct reading drum scale, two standard size cups, 100M8; two standard size plungers, 100M12, and white opaque twin reflectors. **Each**............**$85.00**

100M7 Colorimeters. Same as 100M6, except with octagonal plungers. **Each**...**$92.50**

100M8 Cups. Standard size. Capacity, approximately 9 ml. Black tubing; clear white glass base. **Each**...........**$2.25**

100M9 Cups. Standard size. Capacity, approximately 9 ml. Black tubing, clear white glass bottom in metal base. **Each**...**$2.25**

100M10 Cups. Standard size. Capacity, approximately 9 ml. White tubing, clear white glass base. **Each**...........**$2.50**

100M11 Cups. Standard size. Capacity, approximately 9 ml. White tubing, clear white glass bottom in metal base. **Each**...**$2.50**

100M12 Plungers. Standard size. For above cups. Black tubing; clear white glass bottom. **Each**..............**$2.50**

100M13 Plungers. Standard size. For above cups. Octagonal; solid white glass. All surfaces polished. **Each**....**$5.00**

100M14 Cups. Medium size. Capacity, approximately 3 ml. White tubing; clear white glass base. **Each**..........**$2.50**

100M15 Plungers. Medium size. For cups 100M14. Round; solid white glass. All surfaces polished. **Each**.........**$4.00**

100M16 Micro Cups. Consists of a white glass cup, 100M17. Capacity, approximately 1 ml. With clear white glass bottom in separate metal base which is adjustable in height. **Each**...**$3.80**

100M17 Glass Cups, For 100M16. **Each**..........**$2.00**

100M18 Metal Bases, For 100M16. **Each**..........**$1.80**

Note: Glass cups, 100M17 are interchangeable in the metal base, 100M18, but cannot be used without it.

100M19 Micro Plungers. For cups 100M16. Round, solid, clear white glass with polished surfaces. **Each**........**$5.00**

100M20 Micro Plungers. Same as 100M19, except made of quartz. **Each**...**$6.00**

All cups and plungers, 100M8 to 100M15, are for color measurement with a maximum liquid depth of 50 mm.; cups and plungers, 100M16 and 100M19, are for maximum liquid depth of 30 mm. Capacity of the cups is given for the respective maximum liquid depth.

100M21 Plungers, Hollow. With a liquid depth up to 100 mm. Can be used with any standard size cup. Consists of all parts listed below. **Complete**.....................**$8.00**

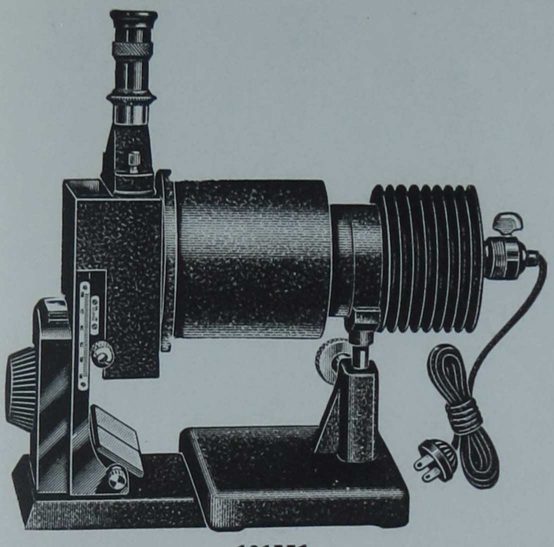
Parts for Plunger, 100M21

100M22 Metal Holders. With short solid glass plunger having optically ground and polished surfaces. **Each**.....**$4.00**

100M23 Metal Sockets. With circular spring clip for holding the plunger tube. **Each**...........................**$1.50**

100M24 Plunger Tubes. Clear white glass. **Each**....**$2.50**

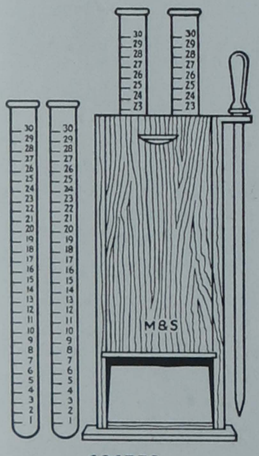
Colorimeters, Continued



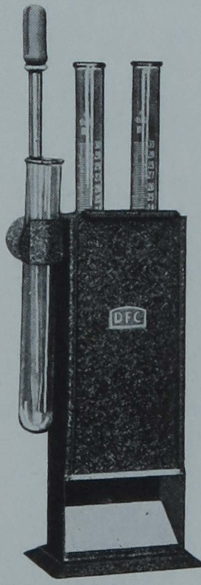
101M1

101M1 Colorimeters, Nephelometer Attachment. The 100M6 colorimeter can be converted readily into a nephelometer by means of this specially designed nephelometer lamp and a set of specimen tubes and metal cups. The condensing system provides a strong beam of parallel rays leading horizontally into the specimen tubes containing the liquids under examination. The part of the lamp housing with the cooling fins is removable and can be used as a separate illuminating unit. Outfit consists of lamp housing with cooling fins and light shield mounted on an adjustable stand with heavy cast iron base, two condensing lenses, special 100 watt-110-volt projection lamp bulb, and a set of two each metal cups and complete specimen tubes. **Without colorimeter.** **Each**..**$70.00**

101M2 Special Projection Lamp Bulbs. 110 volts. **Each**..**$5.00**



101M3



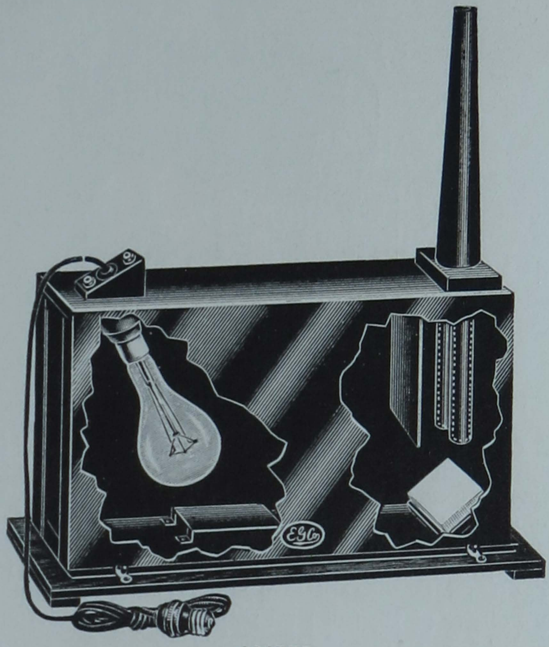
101M6

101M3 Colorimeters, Peebles-Lewis, Student Model. A small but accurate colorimeter designed by Drs. Peebles and Lewis of the University of Colorado. Used for the determination of urea, uric acid, creatine, creatinine in blood and urine, sugar in blood, phenolsulphonphthalein excretion in urine, etc. **Each**..**$3.00**

101M4 Graduated Tubes, Only. For 101M3. **Pair**..**$1.20**

101M5 Pipettes, Only. For 101M3. **Each**..........**$ .25**

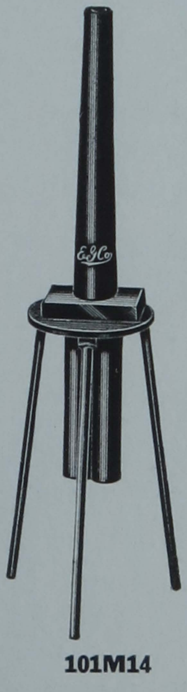
101M6 Colorimeters, Peebles-Lewis, Improved Laboratory Model. Similar to the student model, although somewhat smaller, and made of metal with black crystalline finish **Each**..**$7.50**



101M7

101M7 Colorimeters, Wesson Type. For color comparison of mineral oils, vegetable oils, varnishes and other semi-opaque liquids with Lovibond glasses. Adopted as a standard by the committee on color of oil and meal of the American Oil Chemists Society. Comparisons can be made at any time, on a clear or cloudy day, or if necessary at night, with the assurance that all results obtained will be identical. Complete, including cabinet, Wesson Tintometer, daylight lamp (150-watt, 110 volts), magnesia block, two glass color tubes and electric fittings with six feet of electric cord. **Without** color glasses. **Each**..**$25.00**

Separate Parts



101M14

101M8 Cabinets, Only. With electric fittings, but without lamp, tintometer or magnesia block. **Each**................**$17.50**

101M9 Tintometers, Wesson. Eyepiece and tubeholder for use with cabinet. **Each**..........................**$7.50**

101M10 Tubes, Only. For color comparison, 150 mm. long; 20 mm. outside diameter with flat polished bottom. **Each**.**$ .50**

101M11 Magnesia Blocks, Only. 95 mm. x70 mm.x25 mm. thick. **Each**......**$ .15**

101M12 Mazda Daylight Lamp. 100-watt, 110 volts. **Each**.............**$ .50**

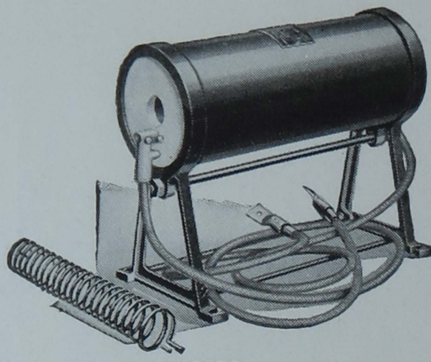
101M13 Mazda Daylight Lamp. 100-watt, 220 volts. **Each**.............**$ .75**

101M14 Tintometer, Wesson. Eyepiece and tubeholder with tripod and two glass tubes **Each**.....................**$9.50**

101M15 Glasses, Standard Lovibond. Red, blue, yellow or amber series. When ordering, specify series and number required. **Each**...................**$2.50**

101M16 Glasses, Standard Lovibond. Set of 34 as adapted by the A O. C. S. Consists of 26 red and 8 yellow glasses. The **Red** glasses running from 0.1 to 0.9 in tenths and from 1 to 12 in singles, with numbers 2.5, 3.5, 7.6, 16 and 20 in addition; the **Yellow** glasses, numbers 1, 2, 3, 5, 10, 15, 20 and 35. **Set**..**$82.50**

Combustion



102M1

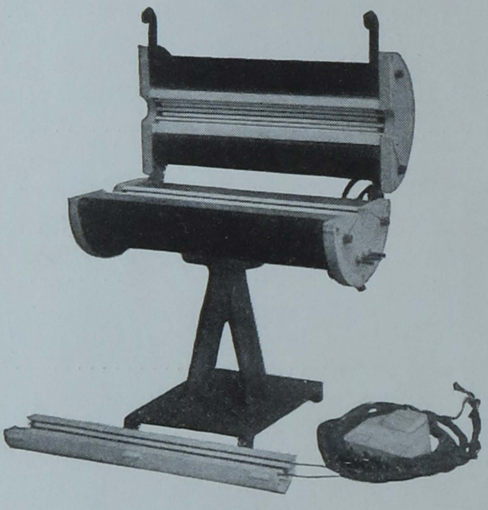
102M1 Combustion Tube Furnaces, Electric. This furnace operates on A. C. through a small transformer, a rheostat providing temperature control. Its heating unit is a heavy coil of chromel wire, whose durability adapts the furnace for regular use at around 2000° F.

Height, 10¾ inches; width, 6⅞ inches; length, 14½ inches; bore, 1⅜ inches in diameter by 12 inches long. Maximum secondary voltage of 16; full load rating of .55 K. W. Used on 110, 220, or 440 volts A. C., 60 cycle. Transformer and rheostat are required. **When ordering, specify current characteristics.** Complete, without rheostat or switchboard and transformer assembly. **Each**..................$26.00

102M2 Rheostat, Only. Each..................$15.00

102M3 Switchboard and Transformer Assembly, Only. Each..................$30.00

102M4 Complete Heating Unit, Only. Each.......$3.25



102M5

102M5 Combustion Tube Furnaces, Electric. Mounted on cast iron base. Hinged design. Maximum safe working temperature, 1832° F. (1000° C.), which temperature can be reached in 40 to 45 minutes. For intermittent periods of comparatively short duration, it may be operated at a temperature up to 1950° F. (1065° C.). For operation on either 110 or 220 volts. Supplied with 6 feet of flexible leads and connector plug, together with instruction chart. Inside dimensions of chamber: 1¼x12 inches; height to center, 9½ inches. Current consumption, 750 watts. Net weight, furnace only, 25 pounds; with rheostat, 32 pounds. Complete, without rheostat. **Each**..................$42.50

102M6 Rheostat, Only. Required to control the temperature at any point between 1000° F. and the maximum. **Each**..................$16.00

102M7 Complete Heating Unit, Only. Each.......$4.00

102M8 Refractories, Only. (2 required.) **Set** of 2...$2.25

102M9 Coiled Wires, Only. (2 required.) **Set** of 2...$1.75

102M10

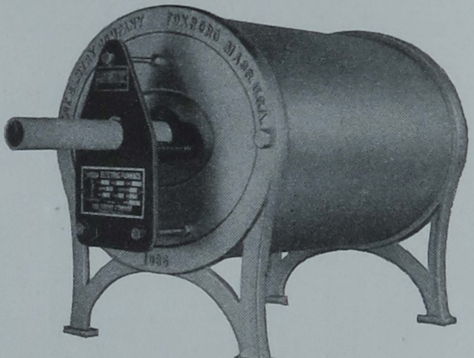
102M10 Combustion Tube Furnaces, Electric. (Part F of combustion train, see page 103.) For carbon determinations. Same as 102M5, except of solid construction. Bore, 1½ inches by 12 inches long; height to center, 10½ inches; watt consumption, 600. For operation on either 110 or 220 volts. Complete, without rheostat. **Each**..................$25.00

102M11 Rheostat, Only. (Part G of combustion train, see page 103.) **Each**..................$13.75

102M12 Complete Heating Unit, Only. Each......$3.25

102M13 Refractory, Only. (One required.) **Each**...$1.75

102M14 Coiled Wire, Only. (One required.) **Each**..$1.50



102M15

102M15 Combustion Tube Furnaces, High Temperature, Electric. For carbon analysis of steel and special ferrous alloys, oil, chemical and cement products. Heating elements of silicon carbide allow operating temperatures between 700° C. (1300° F.) and 1400° C. (2552° F.) and are equipped with air-cooled terminals of heat resistant alloy. Furnace is provided with a thermo-couple hole ⅜ inch in diameter in the heating chamber for pyrometer use, and a special combustion tube with double reduced end, 1-inch bore and 26 inches long. For operation on 110 volts A. C. or D. C. Maximum current demand, 2½ kw. A transformer can be supplied when connection to 220 volts is required. Overall length, 20 inches; height, 15 inches; width, 14 inches. Shipping weight, 165 pounds. Complete with rheostat for 110 volts. **Each**..................$112.00

102M16 Replacement Tubes. Each..............$8.20

102M17 Furnaces. With 1⅛-inch bore by 28 inches long tube. Complete with rheostat for 110 volts. **Each**..$115.00

102M18 Replacement Tubes. Each..............$8.80

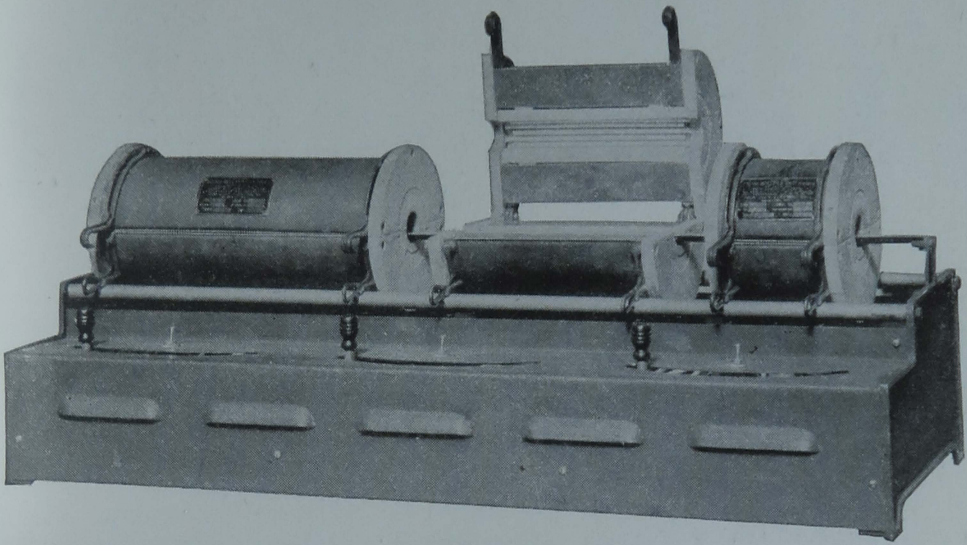
102M19 Furnaces. With 1¼-inch bore by 28 inches long tube. Complete with rheostat for 110 volts. **Each**..$120.00

102M20 Replacement Tubes. Each..............$9.60

102M21 Transformers. For 220-volt, 60-cycle connection **Each**..................$38.00

102M22 Replacement Heating Elements. For above high temperature furnaces. (Set of two.). **Set**............$8.30

Combustion, Continued



103M1

Combustion Furnaces, Organic, Multiple Unit. Designed to furnish combustion processes with exact and easily controlled heat. Each section of the furnace is used independently of the others. The furnace assembly comprises the furnace sections and a base section in which are mounted the toggle switches, rheostats and the rails upon which the furnace sections slide. The base is enclosed to prevent accidental contact with terminals or rheostat connections, and the operating handles of the rheostats and switches extend through the top of the enclosure at the most convenient place for the operator. The malleable iron frames of the furnace sections are formed with inverted "V" grooves fitted to the front rails. Each section is always in perfect alignment with the others and can not become dislodged when opened or moved. The upper half of each furnace section is hinged to the lower half and is provided with a stop to hold it in the open position.

The trough, for supporting the combustion tube, is made of non-oxidizing metal and is mounted at each end in a slotted bracket to allow for expansion. It is also free from all contact with the furnace sections. The furnace heads are of the flush type so that the furnaces may be grouped two or three together to form, in effect, one complete furnace. There are two heating units in each furnace section, each unit consisting of a coiled wire mounted in a semi-circular refractory. Both units for each section are interchangeable and can be replaced easily. Maximum safe working temperature, 1832° F. (1000° C.)

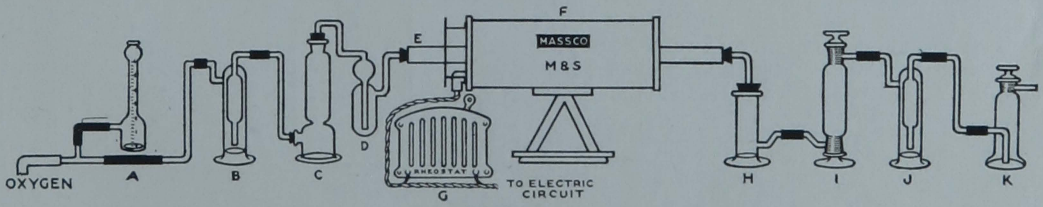
	Inside Diameter, Inches	No. of Sections	Inside Lengths Sections Inches	Bench Space, Inches	Height, Inches Closed	Open	Amperes 115 Volts	230 Volts	Watts	Shipping Weight, Pounds	**Each**
103M1 Furnaces..	1¼	3	4, 8 and 12	12½x36	12¼	17½	15.0	7.5	1726	125	**$210.00**
103M2 Furnaces..	1¼	3	3, 6 and 8	12½x30	12¼	17½	12.8	6.09	1400	105	**210.00**
103M3 Furnaces..	1¼	5	3, 6, 6, 3 and 3	12½x42	12¼	17½	16.9	8.45	1942	160	**290.00**

103M4 Furnaces, Preheating. For those determinations where it is necessary to heat the incoming gas.

Inside Diameter, Inches	Length, Inches	Height to Center, Inches	Bench Space, Inches	Height, Inches Closed	Open	Watts	Shipping Weight, Pounds	**Each**
1¼	8	9	9½x11	12¼	17½	750	38	**$63.75**

Renewal Parts for Above Furnaces

	For Furnace 103M1			**For Furnace 103M2**			**For Furnace 103M3**		**For Furnace 103M4**
Section length, inches..............	4	8	12	3	6	8	3	6	8
103M5 Complete Heating Unit....	**$3.50**	**4.25**	**4.50**	**3.75**	**4.50**	**4.75**	**3.75**	**4.50**	**4.25**
103M6 Refractories, Only. Set...	**$2.00**	**2.25**	**2.25**	**2.00**	**2.25**	**2.25**	**2.00**	**2.25**	**2.25**
103M7 Coiled Wires, Only. Set ..	**$1.50**	**2.00**	**2.25**	**1.75**	**2.25**	**2.50**	**1.75**	**2.25**	**2.00**



103M8

103M8 Combustion Train. For determination of carbon in steel. Consists of:

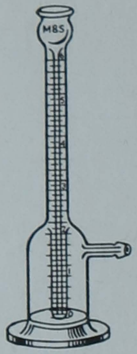
104M1 Mercury Gauge (A)
104M2 Gas Washing Bottles (B & J)
141M1 Drying Tower (C)
104M3 Mercury Check Valve (D)
104M1 Combustion Tube 30 in. by ⅞ in. bore. (E)

102M10 Electric Combustion Tube Furnace (F)
102M11 Rheostat (G)
104M4 Zinc Jar (H)
104M5 Drying Jar (I)
104M6 Absorption Bulb (K)

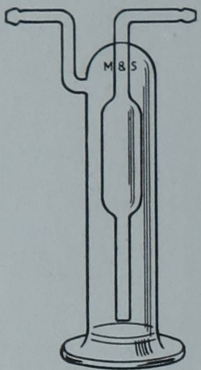
Complete with glass and rubber tubing connections. **Each**.. **$56.00**

Note: Parts of above are listed separately on pages 102, 104, 106 and 141.
Note: Gas regulator for oxygen cylinder is shown on page 192.

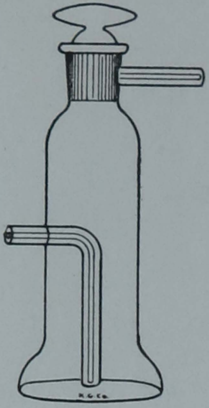
Combustion, Continued



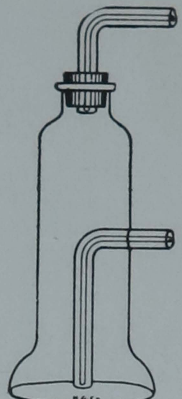
104M1



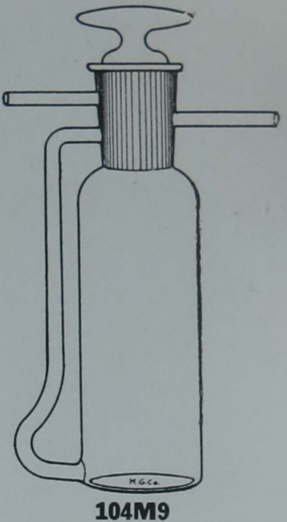
104M2



104M6



104M7



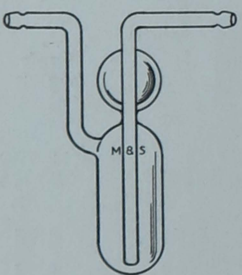
104M9

104M1 Mercury Gauges. (Part A of Combustion Train.) Serves as safety valve in relieving any excess pressure should the system become choked or the pressure regulating valve on the oxygen tank fail to work properly. It also indicates the oxygen pressure in the train.

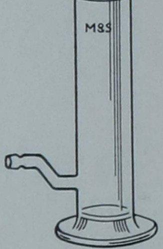
Graduated in ⅛-inch divisions and is calibrated to indicate pressure up to 6 inches. **Each**.......................$2.25

104M2 Gas Washing Bottles, Fleming. (Parts B and J of Combustion Train.) Made entirely of thoroughly annealed glass. Can be filled with a sodium or potassium hydrate solution, and used to indicate the flow of oxygen, also to remove traces of CO_2 prior to entering the combustion tube. May also be filled with sulphuric acid and used at the end of a train to indicate the flow of gases as well as to prevent air from backing into the CO_2 absorption bulb by way of the exit tube. Height, about 7½ inches. **Each**...........................$1.75

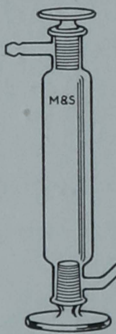
Note: Other gas washing bottles shown on page 201.



104M3



104M4



104M5

104M3 Mercury Check Valves. (Part D of Combustion Train.) Used as check valve or small trap. Usually filled with 2 inches of mercury as a sealing medium, and connected just before the combustion tube, thus sealing the purifying train when the combustion tube is disconnected. **Each**......$1.00

104M4 Zinc Jars, Absorption, Fleming. (Part H of Combustion Train.) Opening at top takes a 1-hole rubber stopper. Height of jar, about 5 inches. It is usually filled with granulated zinc to remove sulphur fumes, acid fumes, entrained litharge, etc., which are carried by the burned gases.**Each**..$1.00

104M5 Drying Jars. (Part I of Combustion Train.) With two glass stoppers. The stopper at the top has an opening to the outlet tube which may be turned to open or close the outlet. The stopper at the bottom is integral with the base. It has an opening to the inlet tube. Stopper may be turned so as to close or open the inlet.

Usually filled with anhydrone, P_2O_5, or calcium chloride, and used to remove moisture. Height, overall, about 7 inches. **Each**...$2.50

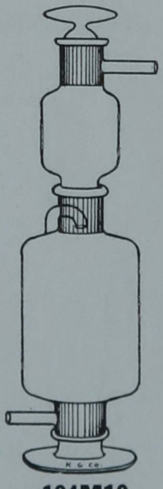
Note: See Combustion Train on page 103.

104M6 Absorption Bulbs, Midvale, Stetser-Norton. (Part K of Combustion Train.) Same as 104M7, except has a glass stopper in the top which has an opening to outlet tube. This eliminates rubber stopper and permits outlet tube to be sealed for weighing. **Each**...........................$2.50

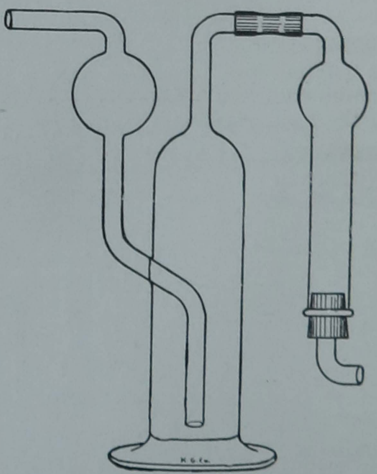
104M7 Absorption Bulbs, Midvale, Stetser-Norton Modification. Bulb is 34 mm. diameter; base, 46 mm.; and height, 120 mm. Furnished with rubber stoppers and capillary outlet tubes. Ascarite is usually used as the absorbent in this bulb. **Each**...$1.50

104M8 Absorption Bulbs, Midvale. For CO_2 absorptions. Bulb is 29 mm. diameter; height, 127 mm. Same as 104M7, except without rubber stopper and capillary tube. **Each**...$1.50

104M9 Absorption Bulbs, Nesbitt. For CO_2 absorption in carbon determinations. Provided with a ground-in stopper which serves to seal the opening of the absorbent chamber. It also makes it possible to seal or open the inlet, or to seal or open the outlet. One position of the stopper opens all passages for the flow of the gases through the bulb and a quarter turn of the stopper completely seals for weighing. Stoppers and bulb bear corresponding identification numbers. **Each**...$4.00



104M10

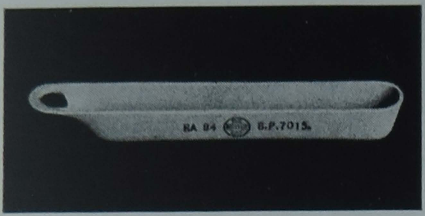


104M11

104M10 Absorption Bulbs, Fleming-Martin. For the absorption of CO_2 in the determination of carbon in steel by direct combustion. Glass stoppers have openings to the connecting tubes. By turning these stoppers the bulb is sealed for weighing. It has two compartments connected with ground joint. **Each**.................................$6.00

104M11 Absorption Bulbs, Johnson. Original design; for liquid absorbents. Complete with tube, rubber stopper, outlet tube and rubber connections. **Each**..............$3.00

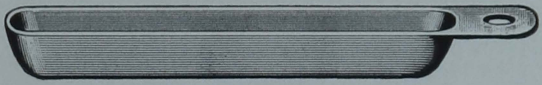
Combustion Boats



105M1

105M1 Combustion Boats, Alundum. Particularly well suited for conditions met in determinations of carbon in iron and steel. R. R. Alundum (see page 107) is recommended to protect boats from slagging effect of iron oxide formed during combustion. Before using in quantitative work, combustion boat should be ignited to remove small amount of carbon in ink of the trade-mark and any dust. Otherwise, a high result will be obtained. Supplied in a dense mixture, RA 84. Boat is also valuable for other kinds of determinations involving combustions at high temperatures and can be supplied in many sizes with a thin or thick wall as may be desired. Wall thickness of standard sizes as regularly furnished is 1/16 inch.

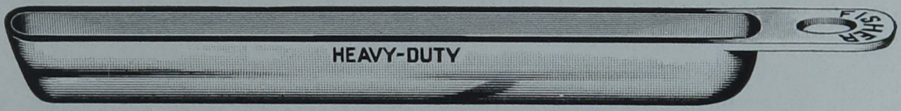
Size	**1**	**2**	**3**	**4**	**5**	**6**
Length, inches	3½	3¾	4½	4 7/16	5	5½
Width, inches	½	5/8	5/8	9/16	¾	½
Depth, inches	5/16	3/8	7/16	9/16	7/16	5/16
Each	**$ .30**	**.30**	**.30**	**.30**	**.30**	**.30**



105M2

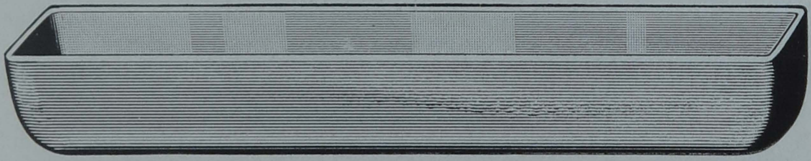
105M2 Combustion Boats, Nickel. Carbon free. Of heavy construction, strongly resistant to oxidation and rupture. Recommended for analysis in which contamination with carbon would be detrimental. Capacity, 15 ml.; length of body, 3½ inches; depth, 7/16 inch; width at top, 5/8 inch. **Each**.......... **$ .55**

105M3 Combustion Boats, Nickel. Made of heavy gauge sheet nickel of low carbon content. Length, 3 inches; width, 5/8 inch; depth, 7/16 inch. **Each**.......... **$ .40**

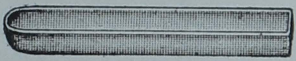


105M4

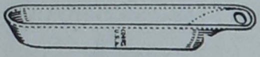
105M4 Combustion Boats, Nickel, Heavy Duty. Made of a special grade of nickel, large in size with heavy walls which lengthen the life and resist shock and temperature changes. Formed from one piece of 19 B. & S. gauge sheet with a carbon content of 0.02 percent or less. Overall length, 4½ inches; inside length, 3¾ inches; width, 5/8 inch; depth, 7/16 inch. **Each**.......... **$ .55**



105M5



105M6



105M8

105M5 Combustion Boats, Scow Type. Of carbon-free nickel, 0.050 inches thick, having a carbon content of from 0 per cent to 0.01 per cent maximum. Inside dimensions: length, 3½ inches; width, ¾ inch; depth, 15/32 inch. Fits a 1-inch inside diameter combustion tube. Ends are vertical for easy withdrawal from the combustion tube. Sides are tapered slightly for easy removal of the fused sample. Corners are rounded. **Each**.......... **$ .65**

105M6 Combustion Boats, Fused Silica, Opaque Glazed. Without handles.

Length, inches	**3**	**4**	**6 3/16**
Width, inches	5/8	¾	¾
Depth, inches	3/8	7/16	5/8
Each	**$1.00**	**1.50**	**2.00**

105M7 Combustion Boats, Fused Silica, Transparent. With handles.

Length, inches	**3**	**4**	**6 3/16**
Width, inches	5/8	¾	¾
Depth, inches	3/8	7/16	5/8
Each	**$3.45**	**4.75**	**6.00**

105M8 Combustion Boats, Coors Porcelain. Glazed inside and outside, with exception of outside bottom surface.

Size	***00000**	***0000**	***000**	***00**	**2**	**4**	**6**	**6A**	**8**
Length, mm	17	30	36	50	60	76	88	97	100
Width, mm	6	6	6	6	10	10	12	16	20
Depth, mm	4	4	4	5	8	9	8	10	13
Each	**$ .35**	**.35**	**.35**	**.35**	**.25**	**.27**	**.28**	**.30**	**.31**

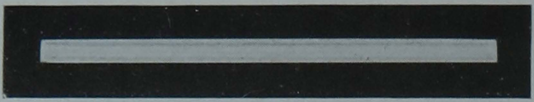
*Suitable for micro analysis.

105M9

105M9 Combustion Boat Shields, Alundum. A thin-walled tube, designed to protect and lengthen the life of combustion tubes by intercepting the spattering metallic oxide during combustion.

Bore, inches	11/16	13/16	¾
Length, inches	4½	5½	5½
Thickness, wall, inches	1/32	1/32	1/32
Diameter, outside, inches	¾	7/8	13/16
Each	**$2.00**	**2.10**	**2.05**

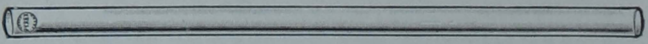
Combustion, Continued



106M1

106M1 Combustion Tubes, Fused Silica, Open End. Glazed surface. Carefully finished to take rubber stoppers.

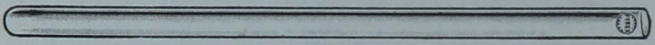
Bore, inches	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{7}{8}$	1	1
Length, inches	24	30	24	30	24	30
Each	**$4.65**	**5.75**	**5.00**	**6.25**	**5.75**	**7.25**



106M2

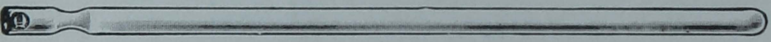
106M2 Combustion Tubes, Pyrex, Glazed, Open End. For continuous operation to 700° C, or for short periods to 850° C.

Length, mm.	**300**	**450**	**600**	**750**	**900**
13mm. I.D. x 17 mm. O.D.					
Each	**$ .36**	**.50**	**.80**	**1.20**	**1.30**
Quantity in case	72	48	36	24	24
Case	**$23.33**	**21.60**	**25.92**	**25.92**	**28.08**
15mm. I.D. x 20mm. O.D.					
Each	**$ .40**	**.60**	**1.00**	**1.40**	**1.60**
Quantity in case	72	48	36	24	24
Case	**$25.92**	**25.92**	**32.40**	**30.24**	**34.56**
17mm. I.D. x 22mm. O.D.					
Each	**$ .60**	**.90**	**1.20**	**1.50**	**1.70**
Quantity in case	48	36	24	18	18
Case	**$25.92**	**29.16**	**25.92**	**24.30**	**27.54**
19mm. I.D. x 25mm. O.D.					
Each	**$ .90**	**1.40**	**1.60**	**1.80**	**2.00**
Quantity in case	36	24	18	12	12
Case	**$29.16**	**30.24**	**25.92**	**19.44**	**21.60**



106M3

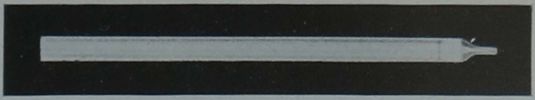
106M3 Combustion Tubes, Pyrex, Round Closed End. Identical in specifications and prices to 106M2 tubes.



106M4

106M4 Combustion Tubes, Pyrex, Constricted End. For continuous operation to 700° C. Quantity in case, 24.

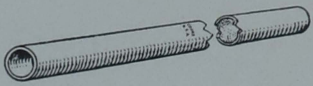
Length, mm.	**615**	**700**
17mm. I.D. x 22mm. O.D. Each	**$ 1.00**	**1.20**
Case of 24	**$21.60**	**25.92**
19mm. I.D. x 25mm. O.D. Each	**$ 1.25**	**1.45**
Case of 24	**$27.00**	**31.32**



106M5

106M5 Combustion Tubes, Fused Silica, Reduced End. Glazed surface. End is reduced for a length of 1 inch to $\frac{1}{8}$ inch bore, with full $\frac{5}{16}$-inch outside diameter. One inch longer overall than standard tubes.

Bore, inches	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{7}{8}$	1	1
Length, inches	25	31	25	31	25	31
Each	**$6.00**	**7.10**	**6.50**	**7.75**	**7.45**	**8.95**



106M6

106M6 Combustion Tubes, Coors Porcelain, Open End. Suitable for high temperature work; glazed outside only, unless otherwise specified. Prices are for 100 cm. lengths. For shorter lengths, subtract 1% of price for each centimeter.

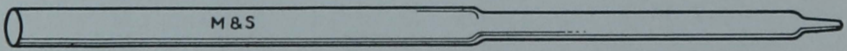
Size	**0**	**1**	**2**	**3**	**4**
Diameter, outside, inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{11}{16}$	$\frac{3}{4}$
mm.	10	12.5	14	17	20
Diameter, inside, inches	$\frac{1}{4}$	$\frac{5}{64}$	$\frac{7}{64}$	$\frac{1}{2}$	$\frac{19}{32}$
mm.	6	8.5	10	12	15
Each	**$7.00**	**7.00**	**7.00**	**7.85**	**8.70**
Size, continued	**4A**	**5**	**5A**	**6**	**7**
Diameter, outside, inches	1	$1\frac{1}{8}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$2\frac{3}{8}$
mm.	25	28	30	38	60
Diameter, inside, inches	$\frac{13}{16}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	2
mm.	20	22	25	28	50
Each	**$8.70**	**9.70**	**11.30**	**13.90**	**17.60**

106M7 Combustion Tubes, Volcanus, Open End. For high temperatures up to 2700° F. or 1500° C. Very resistant to chemical action; unglazed throughout; thoroughly vitrified; impervious to gases.

Size	**1**	**2**	**3**	**4**
Diameter, inside, inches	$\frac{7}{8}$	$\frac{7}{8}$	1	1
Diameter, outside, inches	$1\frac{1}{16}$	$1\frac{1}{16}$	$1\frac{3}{16}$	$1\frac{3}{16}$
Length, inches	24	30	24	30
Each	**$5.90**	**6.20**	**6.50**	**6.90**

106M8 Combustion Tubes, Volcanus, Reduced End. Outside diameter of reduced end, 10 mm.

Size	**1**	**2**
Diameter, inside, inches	$\frac{7}{8}$	1
Diameter, outside, inches	$1\frac{6}{16}$	$1\frac{3}{16}$
Length, inches	30	30
Each	**$6.90**	**7.90**



106M13

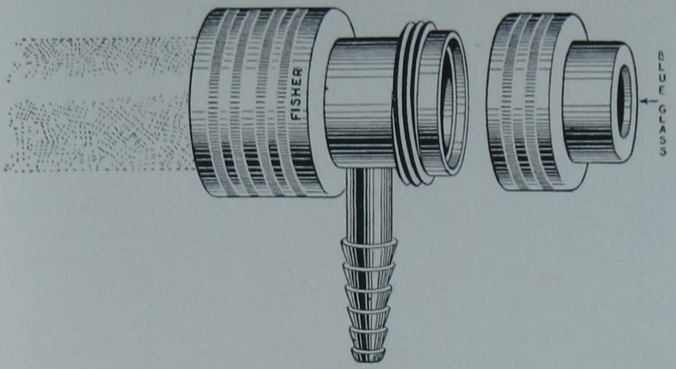
Combustion Tubes, McDanel. Especially designed for high temperature. Suitable for all carbon combustion temperatures up to 2900° F. The tube wall does not react chemically with sputterings of iron oxide, lead salts, copper oxide, aluminum, tin or zinc. The reduced ends will accommodate rubber tubing down to 5 mm. inside diameter.

Diameter, inside, inches	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{3}{4}$
Diameter, outside, inches	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	2
106M9 Tubes, Open End. Length, overall, 24 inches. **Each**	**$6.50**	**6.75**	**7.00**	**7.50**	**8.50**	**10.25**	**10.75**
106M10 Tubes, Open End. Length overall, 30 inches. **Each**	**$8.00**	**8.25**	**8.75**	**9.75**	**11.00**	**12.75**	**15.50**
106M11 Tubes, Reduced End. Length overall, 24 inches. **Each**	**$6.50**	**6.75**	**7.00**	**7.50**	**8.50**	**10.25**	**10.75**
106M12 Tubes, Reduced End. Length overall, 30 inches. **Each**	**$8.00**	**8.25**	**8.75**	**9.75**	**11.00**	**12.75**	**15.50**

106M13 Combustion Tubes, McDanel, Double Reduced. For use with high temperature combustion furnaces.

Length, overall, inches	**25**	**27**	**25**	**28**	**25**	**28**
Diameter, inside, inches	1	1	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{4}$
Diameter, outside, inches	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{1}{2}$
Each	**$9.75**	**10.50**	**11.25**	**12.00**	**11.75**	**12.50**

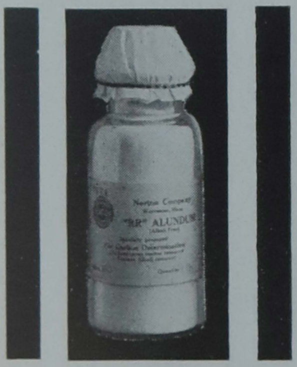
Combustion, Continued



107M1

107M1 Breech Connectors. Regular size. Simplifies the operations in making carbon determinations. The body is attached to the combustion tube by plaster of Paris mixed with 2% acetic acid. It has a blue glass window in the rear to permit observation of the combustion without disturbing any connections. A few turns of the breech block opens or seals the tube, and combustion boats can be inserted or withdrawn without removing any connections. It also eliminates the use of a rubber stopper. Designed to be used on tubes having inside diameters from ¾ inch to 1 inch. The adapter of the connector has an inside diameter of 1⅜ inches and can be attached to any combustion tube having a smaller outside diameter. **Each** **$11.00**

107M2 Breech Connectors. Large size. Same as 107M1, except for combustion tubes from 1 to 1¼ inch inside diameter. The part which is attached to the tube has an inside diameter of 1¾ inches, and can be attached to any combustion tube having an outside diameter smaller than 1¾ inches. **Each** **$14.00**



107M3

R. R. Alundum (Crystalline Alumina). In preparing samples for the determination of carbon in steel, it has been found desirable to protect the combustion boat from the molten metal.

This is best accomplished by spreading a layer of very pure electrically fused alumina on the bottom of the boat before introducing the sample of steel. This prevents contact of the softened metal or oxides with the boat and materially prolongs its service.

Regularly furnished in 60 mesh grains. 90 and 120 mesh grains furnished on request at same price.

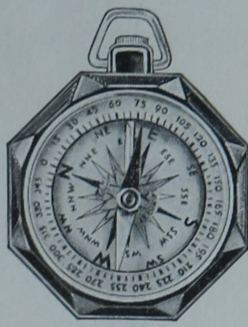
107M3 R. R. Alundum, Blue Label. 60 Mesh. Specially treated to remove carbonaceous matter and surface alkali. The purity of this grade is assured by quantitative analysis of a sample from each lot made. A very satisfactory blank determination for carbon is maintained. The carbon content is maintained below .003%.

1 pound bottle.	**Each**	**$1.50**
2 pound bottle.	**Each**	**$2.15**
5 pound bottle.	**Each**	**$4.20**

107M4 R. R. Alundum, White Label. 60 mesh.

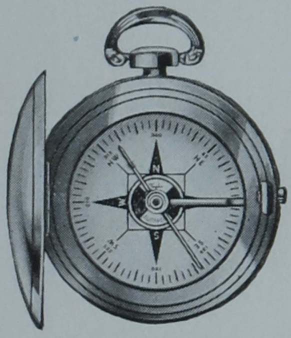
1 pound bottle.	**Each**	**$1.25**
2 pound bottle.	**Each**	**$1.70**
5 pound bottle.	**Each**	**$3.50**

Compasses



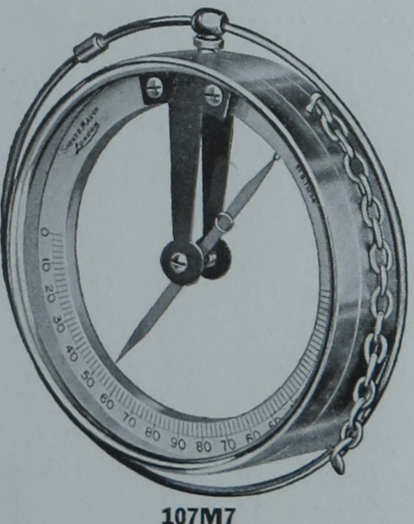
107M5

107M5 Compasses, Pocket, Taylor. Will withstand hard service. Made of material that will not tarnish or discolor. With unbreakable crystal. Jeweled center assures accuracy. Needle rotates on jeweled bearing. Aluminum dial. Has throw-off to protect needle and point when not in use. Has ring for attaching to chain or strap. Case is black Bakelite. **Each** **$1.00**



107M6

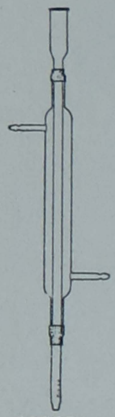
107M6 Compasses, Pocket, Bar Needle, Taylor. Many prefer compasses having the bar needle; first, on account of their extreme sensitivity, and second, because they can be magnetized more strongly and retain their magnetism indefinitely. The needle of this compass is heavily magnetized, delicately balanced, and extremely sensitive. The center is jeweled and a stop lifts the needle off center point when lid of case is closed. Compass has grained-bronze, hunter case, 2 inches in diameter, aluminum dial, jeweled center, and automatic stop lift. **Each** **$4.25**

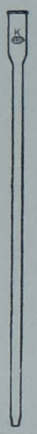


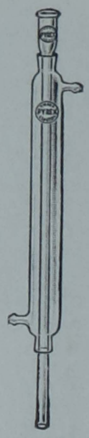
107M7

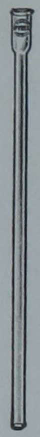
107M7 Compasses, Miner's Dipping Needles, Taylor. Designed for use of mining engineers and prospectors. Known for its precision and reliability. Short and Mason, fixed-meridian type, 3-inch diameter gilt case. In morocco carrying case. **Each** **$33.00**

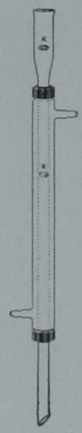
Condensers

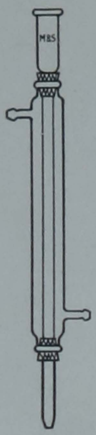

108M1

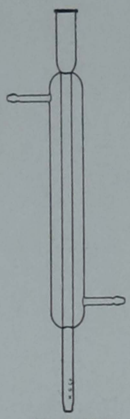

108M2

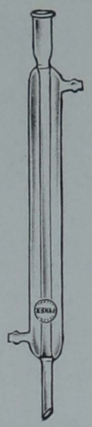

108M3

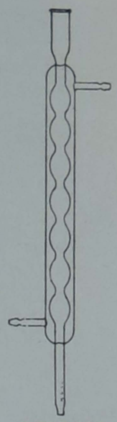

108M4

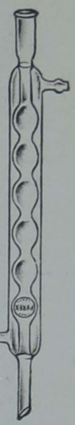

108M5


108M8


108M10


108M11


108M12


108M13

108M1 Condensers, Liebig. With loose inner tube, for rubber connections.

Lth., jacket, shldr. to shldr.						
mm.	250	300	400	500	600	750
in.	10	12	16	20	24	30
Quantity in case	36	36	36	36	24	12
Each	**$ .75**	**.80**	**.85**	**.90**	**1.00**	**1.10**
Case	**$24.30**	**25.92**	**27.54**	**29.16**	**21.60**	**11.88**

108M2 Condenser Inner Tubes, Only. For 108M1 condensers.

Length, overall						
mm.	500	550	650	750	850	1000
in.	20	22	26	30	34	40
Quantity in case	48	48	48	48	36	24
Each	**$ .24**	**.26**	**.28**	**.30**	**.32**	**.34**
Case	**$10.37**	**11.23**	**12.10**	**12.96**	**10.37**	**7.34**

108M3 Condensers, Liebig, Pyrex. With loose inner tube for rubber connections.

Length, jacket, shldr. to shldr.					
mm.	250	300	400	500	600
in.	10	12	16	20	24
Quantity in case	12	12	12	6	6
Each	**$ 1.85**	**2.05**	**2.35**	**2.65**	**2.95**
Case	**$19.98**	**22.14**	**25.38**	**14.31**	**15.93**

108M4 Condenser Inner Tubes, Only, Pyrex. For 108M3 condensers.

Length, overall					
mm.	500	550	650	750	850
in.	20	22	26	30	34
Each	**$ .45**	**.50**	**.60**	**.70**	**.80**
Case of 24	**$ 9.72**	**10.80**	**12.96**	**15.12**	**17.28**

108M5 Condensers, Modern Liebig. With Bakelite nut and screw thread connections. Thoroughly annealed. The inlet and outlet tubes, which are 1 inch long, are approximately ½-inch from the shoulders, doing away with dead spaces in the cooling chamber. The jackets have outside diameters of ⅞ inches, decreasing considerably the space between inner tube and jacket and giving greater cooling efficiency due to increased rate of flow of cooling medium.

Lth., jacket, shldr. to shldr.						
mm.	250	300	400	500	600	750
in.	10	12	16	20	24	30
Quantity in case	36	36	36	36	24	12
Each	**$ .75**	**.80**	**.85**	**.90**	**1.00**	**1.10**
Case	**$24.30**	**25.92**	**27.54**	**29.16**	**21.60**	**11.88**

108M6 Condenser Inner Tubes, Only. For 108M5 condensers.

Length, overall						
mm.	450	500	600	700	800	950
in.	18	20	24	28	32	38
Quantity in case	48	48	48	48	36	24
Each	**$ .24**	**.26**	**.28**	**.30**	**.32**	**.34**
Case	**$10.37**	**11.23**	**12.10**	**12.96**	**10.37**	**7.34**

108M7 Bakelite Nuts and Rubber Washers. For 108M5—same for all sizes. **Dozen** . . . . **$ .30**

108M8 Condensers, Red Seal, Improved. 35 mm. diameter 1-piece jacket, with reinforced tooled ends for stoppers. Fitted with red rubber leak-proof stoppers. Perfectly annealed and strain free.

Length, jacket, shoulder to shoulder			
mm.	300	375	500
in.	12	15	20
Each	**$ .86**	**.98**	**1.14**

108M9 Condenser Inner Tubes, Only. For 108M8 condensers.

Length, overall			
mm.	525	600	725
in.	21	24	29
Each	**$ .24**	**.26**	**.28**

108M10 Condensers, Liebig. With straight inner tube sealed in jacket.

Lth., jacket, shldr. to shldr.						
mm.	250	300	400	500	600	750
in.	10	12	16	20	24	30
Quantity in case	24	24	24	18	18	12
Each	**$ .90**	**.95**	**1.10**	**1.20**	**1.40**	**1.60**
Case	**$19.44**	**20.52**	**23.76**	**19.44**	**22.68**	**17.28**

108M11 Condensers, Liebig, Pyrex. With straight inner tube sealed in jacket.

Length, jacket, shoulder to shoulder			
mm.	100	200	250
in.	4	8	10
Quantity in case	12	12	12
Each	**$ 1.90**	**2.00**	**2.30**
Case	**$20.52**	**21.60**	**24.84**

Length, jacket, shldr. to shldr., cont'd				
mm.	300	400	500	600
in.	12	16	20	24
Quantity in case	12	6	6	6
Each	**$ 2.55**	**2.85**	**3.15**	**3.45**
Case	**$27.54**	**15.39**	**17.01**	**18.63**

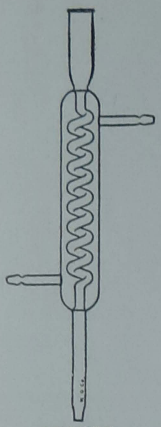
108M12 Condensers, Allihn. With bulb condensing tube sealed in jacket.

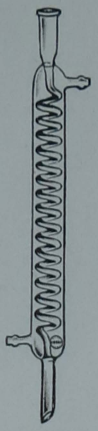
Length, jacket, shldr. to shldr.,				
mm.	200	300	400	600
in.	8	12	16	24
Quantity in case	24	24	18	12
Each	**$ 1.50**	**1.80**	**2.20**	**3.00**
Case	**$32.40**	**38.88**	**35.64**	**32.40**

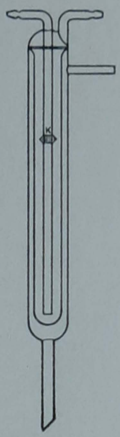
108M13 Condensers, Allihn, Pyrex. With bulb condensing tube sealed in jacket.

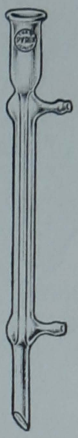
Lth., jacket, shldr. to shldr.						
mm.	200	250	300	400	500	600
in.	8	10	12	16	20	24
Quantity in case	12	12	12	6	6	6
Each	**$ 2.50**	**2.75**	**3.00**	**3.30**	**3.60**	**3.90**
Case	**$27.00**	**29.70**	**32.40**	**17.82**	**19.44**	**21.06**

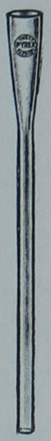
Condensers, Continued


109M1


109M2


109M3


109M6


109M7

109M1 Condensers, Graham. With coil condensing tube sealed into the water jacket.

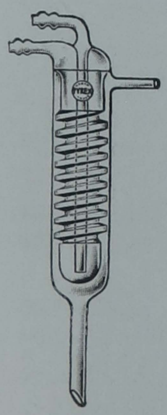
Length, jacket, shoulder to shoulder, **mm.**	**200**	**300**	**400**	**600**
inches.	8	12	16	24
Quantity in case	24	24	18	12
Each	**$ 1.50**	**1.80**	**2.20**	**3.00**
Case	**$32.40**	**38.88**	**35.64**	**32.40**

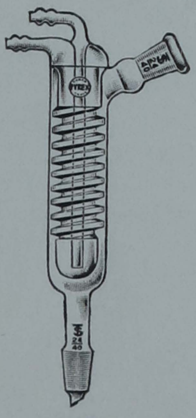
109M2 Condensers, Pyrex, Graham. With coil condensing tube sealed-in.

Lgth. jacket, Shldr. to shldr., **mm.**	**200**	**250**	**300**	**400**	**500**	**600**
in.	8	10	12	16	20	24
Quantity in case	12	12	12	6	6	6
Each	**$ 2.90**	**3.20**	**3.50**	**3.90**	**4.30**	**4.70**
Case	**$31.32**	**34.56**	**37.80**	**21.06**	**23.22**	**25.38**

109M3 Condensers, Reflux, Hopkins.

Length, jacket, shoulder to shoulder **mm.**	**275**
inches	11
Quantity in case	12
Each	**$ 3.00**
Case	**$32.40**


109M4


109M5

109M4 Condensers, Pyrex, Friedrichs. With spiral inner tube.

Length, jacket, shoulder to shoulder **mm.**	**340**
inches	13.6
Quantity in case	4
Each	**$ 4.80**
Case	**$17.28**

109M5 Condensers, Pyrex, Friedrichs. Similar to 109M4 except with interchangeable ground glass joints at top and bottom.

Length, jacket, shoulder to shoulder **mm.**	**340**
inches	13.6
Number, joint ₸	20
Quantity in case	4
Each	**$ 6.80**
Case	**$24.48**

109M6 Condensers, West Type, Pyrex. Embodies these distinctive features: 1. Enlargements in outer jacket at points of tubulation—for strength. 2. Heavy outer jacket and light walled, properly centered inner tube—for durability and efficiency. 3. Minimum amount of space between outer jacket and inner tube—for compactness and speedy performance. 4. Tubulatures on same side of jacket—for convenience.

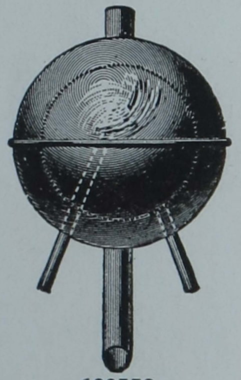
Length of jacket **mm.**	**200**	**250**	**300**	**400**	**500**	**600**	**750**
inches	8	10	12	16	20	24	30
Quantity in case	12	12	12	12	9	9	9
Each	**$ 1.60**	**1.65**	**1.70**	**1.85**	**2.00**	**2.20**	**2.55**
Case	**$17.28**	**17.82**	**18.36**	**19.98**	**16.20**	**17.82**	**20.66**

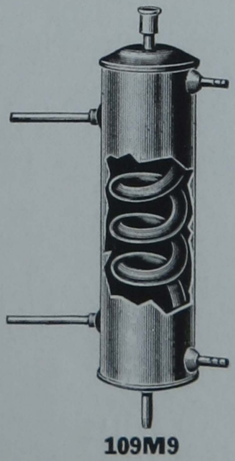
109M7 Condenser Tubes, Pyrex.* A. S. T. M. D-20, D-38 and D-246. Used in the distillation of bituminous materials suitable for road treatment, the sampling and analysis of creosote oil, and the distillation of creosote oil.

Length, overall **mm.**	**360**
inches	14.4
Quantity in case	24
Each	**$ .60**
Case	**$12.96**

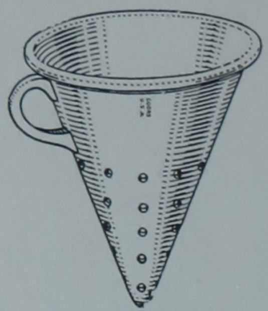
*Used with 164M7 distilling flask.

109M8 Condensers, Extraction, Soxhlet. Cooling water circulates in an inner sphere, while the vapors occupy the chamber between inner and outer sphere. Typical use is on a double-wall oven for maintaining concentration of the liquid heating solution by refluxing the vapors. Heavy copper, tinned inside. Diameter, 3⅞ inches; length overall, 6 inches.
Each........................**$4.50**


109M8

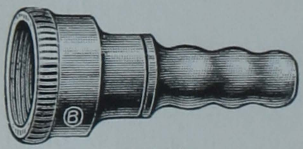

109M9

109M9 Condensers, Hallock. Consists of a block tin coil 2½ feet long inside a heavy copper jacket, equipped with serrated hose connections for cooling water inlet and outlet, and brass bushings with threaded brass arms, 5 inches long, for supporting the condenser. Jacket is lock seamed and soldered, well reinforced, finished in metallic copper spray. Upper end of coil terminates in a ⅞-inch diameter adapter; lower end is tapered to fit small openings. Length of jacket, 15 inches. Length overall, 18 inches. Diameter, 4 inches. **Each**........**$7.50**

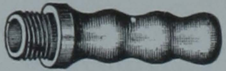


110M1

110M1 Cones, Dissolving, Coors Porcelain. Glazed inside and outside with exception of rim. Diameter, 140 mm.; height, 140 mm.; diameter of holes, 3.5 mm. **Each**....**$4.60**



110M2



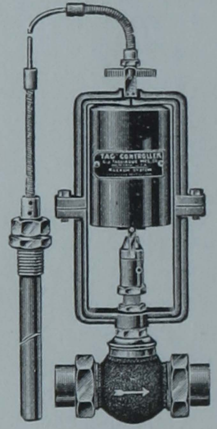
110M4

110M2 Connections, Hose. For threaded faucets; with serrated hose connection. 3/16-inch bore, and leather washer. **Each**..**$ .60**

110M3 Connections, Hose. Same as 110M2, except with hose connection, 9/32-inch bore. **Each**................**$ .60**

110M4 Connections, Hose. Brass, nickel-plated.

I. P. size male thread, inches	¼	⅜	½	¾
Diameter, nipple, inches.......	½	½	9/16	⅝
Each.........................	**$ .20**	**.25**	**.35**	**.45**



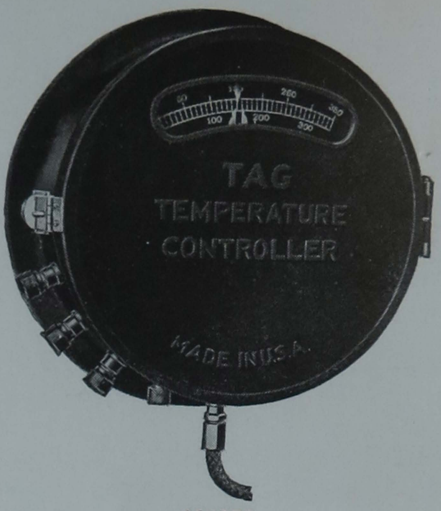
110M5

110M5 Controllers, Self-Acting Temperature. Entirely self contained and self operating. Uses no power outside the energy developed in its own system. Recommended where fine precision of regulation is not necessary or where the steam pressure available is less than 10 pounds. The thermostatic system is rugged; the setting range flexible to include a selection of control points. The main valve stem works smoothly through a special almost frictionless and self-adjusting stuffing box. The controller will close the half-inch to two-inch valves against a maximum steam pressure of 125 pounds.

The valve body of the 2-inch size is of iron with screwed valve end; valve bodies of all other sizes are of bronze with union valve ends.

Complete with 7 feet of flexible armored connecting tubing consisting of bronze capillary, protected with bronze spiral armor enclosed in stainless steel braided webbing; ¾-inch diameter bronze bulb 10 inches long with ¾-inch or 1-inch s. p. t. union connection fitting, and steam strainer. Valves are semi-balanced with hard bronze discs and seats.

Size, inches...	½	¾	1	1¼	1½	2
Each.........	**$56.25**	**60.50**	**66.25**	**71.00**	**75.50**	**86.00**



110M6

Controller, Temperature, Tag, Electric, Indicating. Recommended for controlling the temperature of electrically heated ovens and furnaces, starting and stopping a motor by means of a motor starter as in the case of automatic refrigerating units, operating electrical signal or alarm devices, and many other similar applications.

Furnished as a dial-indicating thermometer, the pointer is actuated by a thermostatic system of any standard temperature range with bulb and connecting tube. The temperature at the bulb is thus indicated by the middle pointer which carries a contact block.

On the same axis as the indicating pointer, adjustable control arms are mounted, ending in pointers visible on the scale. These indicate the temperature cut-in and cut-out of the external relay circuit. They may be set for any differential to maintain the required temperature or pressure. The action of the controller is "on-off."

Specifications

TAG Electric Contact Indicating Controller; mercury, vapor tension or gas-filled, in any range listed; japanned iron case with nickel-plated glass door 8 inches in diameter, for wall mounting; complete with 5 feet of regular flexible connecting tubing and plain stainless steel bulb of standard construction.

No.	Actuation	Range Degrees F Between	Tube Length	**Each**
110M6	**Mercury**......	—40 and+100	Up to 25 ft.	**$82.00**
110M7	**Vapor Tension**	—20 and+500	Up to 250 ft.	**73.50**
110M8	**Gas-filled**.....	—60 and+800	Up to 200 ft.	**79.25**

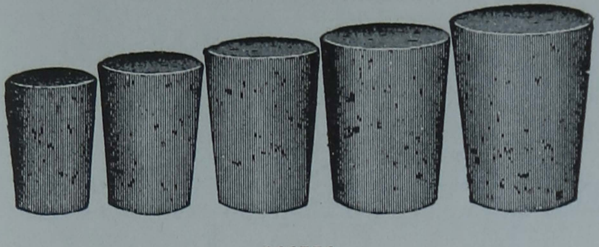
Union connection Hubs can be supplied with ½, ¾, or 1-inch s. p. t. as specified at **$2.50** net extra.

Additional lengths of connecting tubing beyond five feet, up to a maximum length as listed above, can be supplied at **$ .85** net extra per foot for mercury-actuated instruments and **$ .55** net extra per foot for vapor tension and gas-filled instruments.

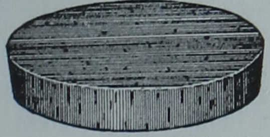
110M9 Relay. Mounted inside controller case. Single pole double throw normally open holding relay for 110 or 220 volts operation as specified. (Silver tungsten contacts, rating 2 amperes or 110-volt non-inductive load.) **Each**...**$10.00**

Auxiliary electric equipment such as special relays, solenoids, contactors, relay switches, motor starters, etc., are not included.

Corks



111M1



111M7

Corks, Tapered, Regular Lengths. Furnished in three qualities, as follows:

XXXX Quality. Especially fine grain. Cut from high quality cork and carefully selected. Recommended for use with volatile liquids, for extraction and distillation apparatus, or where a specially uniform and smooth cork is desired.

XXX Quality. Satisfactory for use as bottle stoppers.

XX Quality. Known as ordinary grade.

Size	**000**	**00**	**0**	**1**	**2**	**3**	**4**	**5**
Diameter, top, inches	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16
Diameter, bottom, inches	5/32	7/32	9/32	21/64	3/8	27/64	15/32	17/32
Regular lengths, inches	1/2	1/2	1/2	5/8	11/16	3/4	13/16	7/8
111M1 XXXX Quality. Hundred	**$ .27**	**.27**	**.27**	**.27**	**.32**	**.41**	**.46**	**.54**
111M2 XXX Quality. Hundred	**$ .18**	**.18**	**.18**	**.18**	**.21**	**.25**	**.28**	**.31**
111M3 XX Quality. Hundred	**$ .16**	**.16**	**.16**	**.16**	**.18**	**.21**	**.25**	**.27**

Size, continued	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Diameter, top, inches	3/4	13/16	7/8	15/16	1	1 1/16	1 1/8	1 3/16	1 1/4
Diameter, bottom, inches	37/64	5/8	43/64	47/64	49/64	53/64	57/64	61/64	1 1/64
Regular lengths, inches	15/16	1	1 1/16	1 1/8	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4
111M1 XXXX Quality. Hundred	**$ .68**	**.81**	**1.12**	**1.51**	**1.81**	**2.04**	**2.20**	**2.40**	**2.88**
111M2 XXX Quality. Hundred	**$ .34**	**.43**	**.60**	**.74**	**.87**	**1.06**	**1.31**	**1.42**	**1.63**
111M3 XX Quality. Hundred.	**$ .30**	**.34**	**.40**	**.50**	**.55**	**.77**	**.84**	**.92**	**1.02**

Size, continued	**15**	**16**	**17**	**18**	**19**	**20**	**22**	**24**	**26**
Diameter, top, inches	1 5/16	1 3/8	1 7/16	1 1/2	1 9/16	1 5/8	1 3/4	1 7/8	2
Diameter, bottom, inches	1 5/64	1 3/32	1 5/32	1 7/32	1 9/32	1 11/32	1 15/32	1 19/32	1 23/32
Regular lengths, inches	1 1/4	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
111M1 XXXX Quality. Hundred	**$3.38**	**3.90**	**4.57**	**5.60**	**6.06**	**6.50**	**7.25**	**8.00**	**10.00**
111M2 XXX Quality. Hundred	**$1.84**	**2.37**	**2.62**	**2.88**	**3.21**	**3.38**	**4.10**	**4.86**	**5.65**
111M3 XX Quality. Hundred	**$1.17**	**1.43**	**1.55**	**1.68**	**1.85**	**2.04**	**2.55**	**3.15**	**4.30**

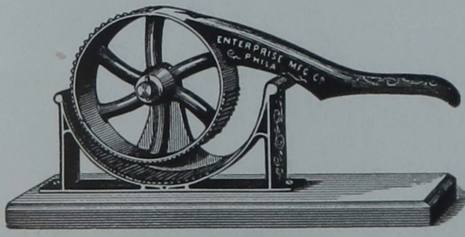
Note: Packed in bags of 500 of one size and quality, discount of 20% from above prices.
Packed in bags of 1000 of one size and quality, discount of 25% from above prices.

111M4 Cork Assortment. XXXX Quality. Consists of 100 corks, 10 each, sizes 6 to 15 inclusive	**$2.25**
111M5 Cork Assortment. XXX Quality. Consists of 100 corks, 10 each, sizes 6 to 15 inclusive	**$1.25**
111M6 Cork Assortment. XX Quality. Consists of 100 corks, 10 each sizes 6 to 15 inclusive	**$ .85**

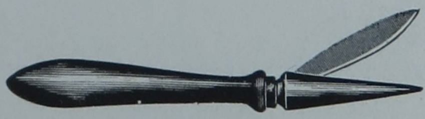
111M7 Corks, Flat, XXX Quality. Cut from good quality of cork and carefully selected. Used with wide-mouthed bottles or jars. All sizes 3/4 inches in length.

Size	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Diameter, top, inches	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8
Diameter, bottom, inches	55/64	63/64	1 7/64	1 15/64	1 23/64	1 31/64	1 39/64	1 47/64	1 55/64	1 63/64
Hundred	**$2.35**	**2.75**	**3.15**	**3.70**	**4.25**	**4.95**	**5.70**	**6.75**	**7.85**	**9.10**

Size, continued	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**
Diameter, top, inches	2 1/4	2 3/8	2 1/2	2 5/8	2 3/4	2 7/8	3	3 1/4	3 1/2	3 3/4	4
Diameter, bottom, inches	2 7/64	2 15/64	2 23/64	2 31/64	2 39/64	2 47/64	2 55/64	3 7/64	3 23/64	3 39/64	3 55/64
Hundred	**$10.30**	**11.80**	**13.30**	**14.60**	**15.90**	**18.50**	**21.05**	**24.50**	**27.80**	**31.30**	**34.90**



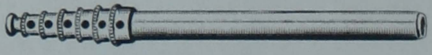
111M8



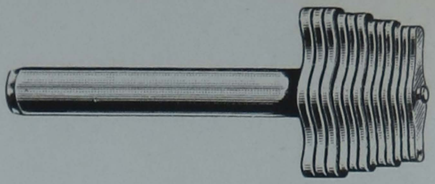
111M9

111M8 Cork Presses. Reduces a cork to the desired size by compressing it between the tapered wheel and jaw, both of which are corrugated to clinch the cork tightly. Cast iron, finished in durable japan. For corks from number 0 to number 22. **Each** **$2.50**

111M9 Cork Borer Sharpeners. A handy tool with which cork borers may be sharpened quickly and easily. The steel knife blade is curved, and pivoted in the brass cone so that the cutting edge of the borer will be trimmed to the correct angle regardless of the borer diameter. **Each** **$1.10**



112M1



112M2

112M1 Cork Borers. Made of hard, polished brass tubing with sharp cutting edge. Made up in sets. The smallest borer measures 3/16 inches in diameter. Each borer is numbered and each set is supplied with a punch rod which also serves as a handle.

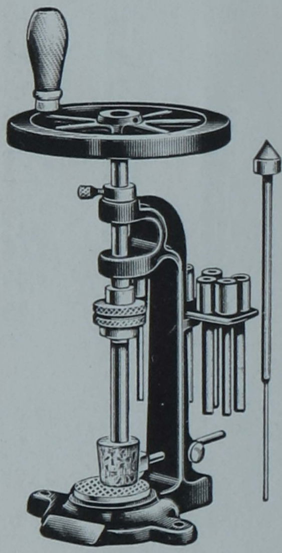
Set number	**1**	**2**	**3**	**4**	**5**
Number in set	3	6	9	12	15
Range of sizes, inclusive, inches	3/16 to 9/32	3/16 to 13/32	3/16 to 17/32	3/16 to 11/16	3/16 to 7/8
Set	**$ .40**	**.95**	**1.60**	**2.00**	**3.25**

112M2 Cork Borers. Made of hard brass tubing with sharp cutting edge and individual flat brass handles. Each borer is numbered. The smallest borer in each set measures 13/64 inches. Furnished in sets, each set containing a punch rod.

Set number	**1**	**2**	**3**	**4**	**5**
Number in set	3	6	9	12	15
Range of sizes, inclusive, inches	13/64 to 19/64	13/64 to 7/16	13/64 to 19/32	13/64 to 47/64	13/64 to 7/8
Set	**$ .60**	**1.25**	**1.75**	**2.35**	**3.00**

112M3 Cork Borers. Exceptionally strong with keen cutting edges. Same as 112M2, except made of steel, nickel plated and polished.

Set number	**1**	**2**	**3**
Number in set	3	6	10
Range of sizes, inclusive, inches	3/16 to 5/16	3/16 to 1/2	3/16 to 3/4
Set	**$1.90**	**3.00**	**5.00**



112M4

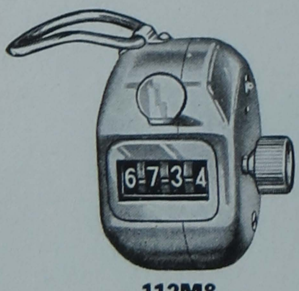
112M4 Cork Boring Machines. For cork or rubber stoppers, with set of ten interchangeable brass borers, sizes from 13/64 inches to 41/64 inches by 3/64 inch intervals. Borers have 5/8-inch chucking shank, a rack being provided for them on machine when not in use. **Each**.................... **$16.00**

112M5 Borers, Only. For 112M4 cork boring machine. Complete set of ten. **Set**........... **$5.50**

112M6, Cotton, Absorbent, Red Cross, J. & J. Long-fiber.

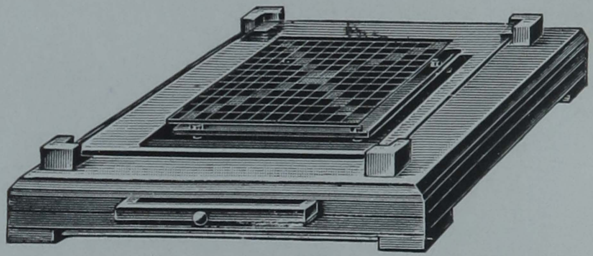
Size package, pounds	1/4	1/2	1
Package	**$ .20**	**.38**	**.60**

112M7 Cotton, Non-Absorbent, J. & J.
One-pound packages.......................... **$ .65**



112M8

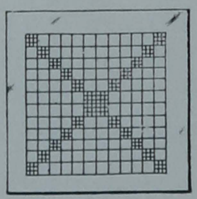
112M8 Counters, Hand Tally. Nickel plated finish. Counts from 0 to 9999. To operate, the knob on the top is pushed down; for resetting to 0, the thumb button on the side is pressed in and turned clockwise. **Each**.......... **$5.00**



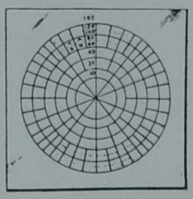
112M9

112M9 Counting Apparatus, Wolffhuegel. For counting colonies of bacteria. Consists of wooden base with drawer for accessories, black and white opaque plate for background, and counting plate 165 mm. square with ruled area 120 mm. square, subdivided in areas of 1 sq. cm. **Each**........ **$10.50**

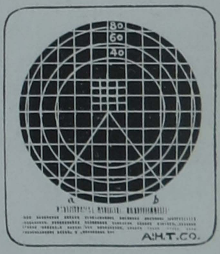
112M10 Counting Apparatus, Jeffers. Same as 112M9, except with counting plate, 165 mm. square with ruled area 132 mm. in diameter and divided by radii and concentric circles. **Each**....................................... **$10.50**



112M11



112M12



112M14

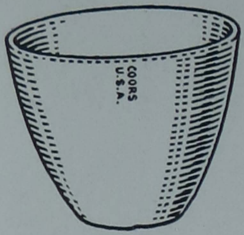
112M11 Counting Plates, Ruled, Wolffhuegel. 165 mm. square, with ruled area 120 mm. square, subdivided in areas of 1 sq. cm. **Each**............................. **$2.50**

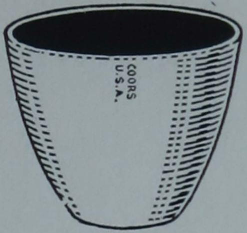
112M12 Counting Plates, Ruled, Jeffers. 165 mm. square, with ruled area 132 mm. in diameter and divided by radii and concentric circles. **Each**......................... **$2.50**

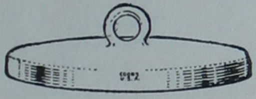
112M13 Counting Cards, Jeffers Ruling. Black cardboard ruled with white lines. **Each**...................... **$ .15**

112M14 Counting Cards, Frost Ruling. Black cardboard ruled in white lines. **Each**...................... **$ .15**

Crucibles


113M1


113M2


113M3

113M1Crucibles, Coors Porcelain, High Form. Glazed inside and outside with exception of outside bottom surface.

Size	**00000***	**0000***	**000**	**00**	**0**	**1**	**1A**	**2**	**3**	**4**	**5**
Diameter, rim, mm.	15	20	26	30	35	41	45	52	62	72	87
Diameter, bottom, mm.	7.5	12	12	14	17	20	21	25	30	34	40
Height, mm.	15	20	19	25	27	35	40	43	50	59	72
Capacity, ml.	1.3	4	5	10	15	30	40	55	90	145	250
Each	**$ .33**	**.28**	**.10**	**.14**	**.17**	**.27**	**.31**	**.33**	**.39**	**.50**	**.61**

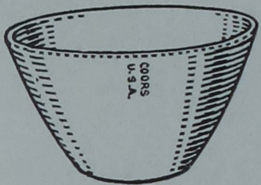
113M2 Crucibles, Coors Porcelain, Black Glaze, High Form. Same as 113M1, except glazed on inside with a refractory black glaze for better observation and control of white precipitates. Dimensions same as 113M1.

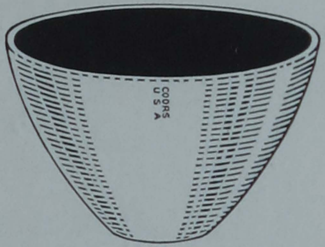
Size	00000*	0000*	000	00	0	1	1A	2	3	4	5
Each	**$ .40**	**.40**	**.28**	**.34**	**.34**	**.54**	**.62**	**.66**	**.78**	**1.00**	**1.22**

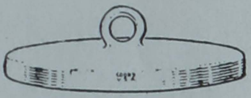
113M3 Crucible Covers, Coors Porcelain. For high form crucibles, 113M1 and 113M2.

Size	**00000***	**0000***	**000**	**00**	**0**	**1**	**1A**	**2**	**3**	**4**	**5**
Diameter, mm.	19	24	32	35	42	47	56	59	73	81	95
Each	**$ .11**	**.11**	**.07**	**.07**	**.07**	**.10**	**.11**	**.11**	**.14**	**.14**	**.18**

*Suitable for Micro Analysis. These sizes used also as parting cups.


113M4


113M5


113M6

113M4 Crucibles, Coors Porcelain, Wide Form. Glazed inside and outside with exception of outside bottom surface.

Size	**000000***	**00000***	**0000**	**000**	**00**	**0**	**1**	**2**	**3**	**4**	**5**
Diameter, rim, mm.	15	18	18	32	37	41	46	56	67	81	96
Diameter, bottom, mm.	6	6	8	13	15	15	18	18	23	29	35
Height, mm.	9	9	12	19	21	25	29	36	44	52	65
Capacity, ml.	0.75	1.4	2	8	12	17	30	50	90	140	250
Each	**$ .28**	**.28**	**.10**	**.14**	**.17**	**.20**	**.28**	**.38**	**.48**	**.55**	**.69**

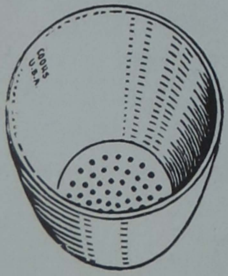
113M5 Crucibles, Coors Porcelain. Black Glaze. For better observation of white precipitates. Dimensions same as 113M4.

Size	000000*	00000*	0000	000	00	0	1	2	3	4	5
Each	**$ .35**	**.35**	**.20**	**.28**	**.34**	**.40**	**.56**	**.76**	**.96**	**1.10**	**1.38**

113M6 Crucible Covers, Coors Porcelain. For wide form crucibles, 113M4 and 113M5.

Size	**000000***	**00000***	**0000**	**000**	**00**	**0**	**1**	**2**	**3**	**4**	**5**
Diameter, rim, mm.	19	23	22	39	44	47	52	65	76	88	107
Each	**$ .11**	**.11**	**.07**	**.07**	**.07**	**.09**	**.09**	**.11**	**.14**	**.18**	**.22**

*Suitable for Micro Analysis.

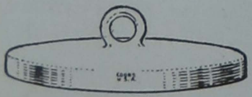

113M7

113M7 Crucibles, Coors Porcelain, Gooch. With perforated bottom, glazed inside and outside with the exception of outside bottom surface.

Size	**1***	**2**	**2A**	**2B**	**3**	**3A**	**3B**	**3C**	**4**	**4A**	**5**
Diameter, rim, mm.	20	28	33	33	35	35	35	35	40	40	55
Diameter, bottom, mm.	14	18	20	20	22	22	22	22	25	25	35
Height, mm.	30	30	33	33	40	40	40	40	43	43	83
Diameter, perforations, mm.	0.5	0.7	0.7	0.5	0.7	0.5	1	0.75	0.6	1	1
Diam., perforated area, mm.	8	11	15	15	16	18	18	11	19	17	29
Capacity, ml.	6	10	20	20	25	25	25	25	35	35	130
Each	**$ .30**	**.33**	**.39**	**.39**	**.44**	**.44**	**.44**	**.44**	**.50**	**.50**	**1.00**

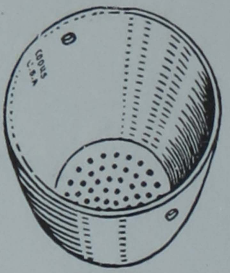
113M8 Crucible Covers, Coors Porcelain. For Gooch Crucibles, 113M7.

Size	**2**	**2A**	**3**	**4**
Diameter, mm.	35	39	42	47
Each	**$ .07**	**.07**	**.07**	**.09**


113M8

*Suitable for Micro or Semi-micro Analysis.

Crucibles, Continued



114M1

114M1 Crucibles, Gooch, Coors Porcelain. With two suspension holes. For use in extraction appratus, etc. Glazed inside and outside with exception of outside bottom surface.

Size	**2**	**3**
Capacity, ml.	10	25
Diameter, rim, mm.	28	35
Diameter, bottom, mm.	18	22
Height, mm.	30	40
Diameter, perforations, mm.	0.7	0.7
Diameter, perforated area, mm.	11	16
Each	**$ .33**	**.44**

114M2

Crucibles, Gooch, Filtering, Jena Glass. Employing a filtering material known as fritted glass. Made from Jena glass ground to powder-like particles of definitely controlled sizes, heated to the sintering point and molded into disks. The disks are fused directly to Jena glass walls. It is possible to select a crucible specifically adapted for each type of work with the assurance of having maximum speed of filtration, and at the same time perfect retention of solids. These crucibles are made in three different porosities, as follows:

114M2 Crucible, Gooch, Filtering, Jena Glass, Coarse, or Number 1 Porosity. Recommended for supporting absorptive layers of additional filtering medium in the treatment of gelatinous precipitates or for filtration at most rapid rates of very coarse substances.

Capacity, ml.	**30**	**50**
Diameter, disc, mm.	30	40
Height, above disc, mm.	35	40
Each	**$1.55**	**2.20**

114M3 Crucible, Gooch, Filtering, Jena Glass, Medium, or Number 3 Porosity. Adapted to the majority of analytical separations which provides precipitates that normally are thrown down in a medium fine condition.

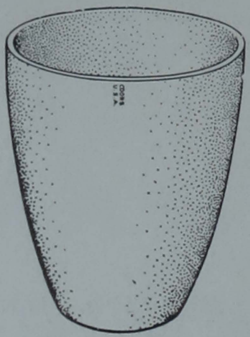
Capacity, ml.	**30**	**50**
Diameter, disc, mm.	30	40
Height, above disc, mm.	35	40
Each	**$1.55**	**2.20**

114M4 Crucible, Gooch, Filtering, Jena Glass, Fine, or Number 4 Porosity. Used for the separation of the very finest of analytical precipitates and particularly those such as barium sulfate.

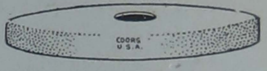
Capacity, ml.	**30**	**50**
Diameter, disc, mm.	30	40
Height, above disc, mm.	35	40
Each	**$1.55**	**2.20**

114M5 Crucible Holders, Jena. For Crucibles 114M2, 114-M3 and 114M4.

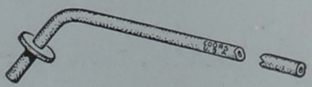
For crucible capacity ml.	30	50
Each	**$1.20**	**1.20**



114M6



114M7



114M8

114M6 Crucibles, Rose, Coors Porcelain, Unglazed. For ignition in reducing atmosphere. With delivery tube, 140x30 mm. in length, 5.5 mm. diameter, and with cover having a 7 mm. hole in center for delivery tube.

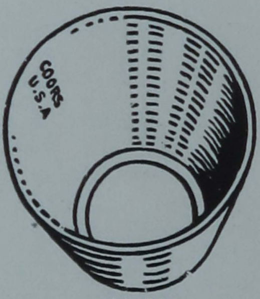
Size	**1**	**2**	**3**
Capacity, ml.	15	30	75
Diameter, rim, mm.	31	39	50
Diameter, bottom, mm.	16	24	28
Height, mm.	37	43	60
Each, complete	**$1.21**	**1.34**	**1.43**

114M7 Crucible Covers, Coors Porcelain. For Crucibles 114M6. Unglazed. With hole for delivery tube, 7 mm. in diameter.

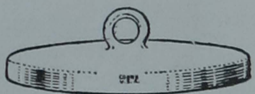
Size	**1**	**2**	**3**
Diameter, mm.	38	42	59
Diameter, hole, mm.	7	7	7
Each	**$ .09**	**.11**	**.14**

114M8 Delivery Tube, Coors Porcelain. For Crucible 114M6. Unglazed. Length, 140x30 mm.; diameter, 5.5 mm.

Each .... **$ .90**



114M9



114M10

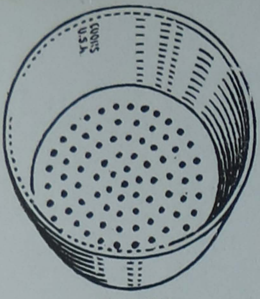
114M9 Crucibles, Caldwell, Coors Porcelain. With open flange bottom to hold perforated discs. Glazed inside and outside with exception of outside bottom surface.

Size	**1**	**3**
Capacity, ml.	15	25
Diameter, rim, mm.	33	39
Diameter, bottom, mm.	20	26
Height, mm.	33	40
Each	**$ .37**	**.43**

114M10 Crucible Covers, Caldwell, Coors Porcelain.

Size	**1**	**3**
Diameter, mm.	40	46
Each	**$ .07**	**.09**

For filter discs for above, see page 152.

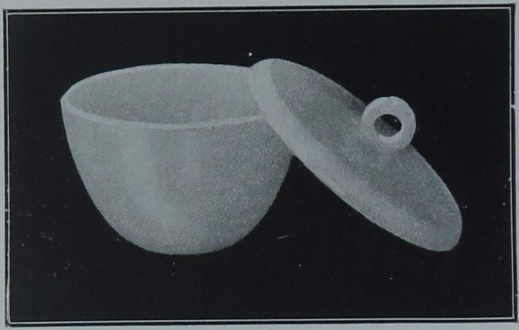


115M1

Crucibles, Continued

115M1 Crucibles, Bitumen, Coors Porcelain. A. S. T. M. D-4 and D-165. With perforated bottom. Glazed inside and outside with exception of outside bottom surface.

Size	**2**
Capacity, ml.	25
Diameter, rim, mm	45
Diameter, bottom, mm	35
Height, mm	24
Diameter, perforations, mm	1
Diameter, perforated area mm	28
Each	**$ .66**



115M2

115M2 Crucibles, Fused Silica, Low Form. Opaque Glazed. Suitable for safe working temperature of 1100° C. Unaffected by reducing flames or by ignition of carbonaceous materials. They are not attacked by nascent chlorine, iodine or bromine.

Capacity, ml.	**4**	**15**	**25**	**40**
Diameter or rim, inches	1 1/16	1⅝	1⅞	2¼
Height, inches	¾	1	1⅛	1 7/16
Each, without covers	**$ .65**	**.85**	**1.00**	**1.15**
115M3 Covers, Only. Each	**$ .55**	**.60**	**.65**	**.85**

115M4 Crucibles, Fused Silica, Tall Form, Opaque Glazed. Same shape as 115M6, otherwise identical with 115M2.

Capacity, ml.	**20**	**30**	**50**
Diameter, rim, inches	1⅜	1 11/16	2
Height, inches	1⅜	1½	2
Each, without covers	**$1.35**	**1.35**	**1.65**
115M5 Covers, Only. Each	**$ .60**	**.60**	**.65**

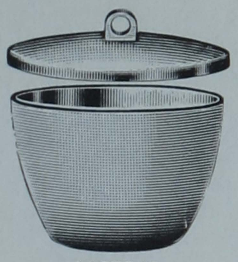
115M6

115M6 Crucibles, Fused Silica, Tall Form, Transparent. Mechanically stronger and more resistant to devitrification and chemical action than the opaque quality.

Capacity, ml.	**10**	**20**	**30**
Diameter, rim, inches	1 1/16	1⅜	1 11/16
Height, inches	1¼	1⅜	1½
Each, without covers	**$1.90**	**2.85**	**3.15**
115M7 Covers, Only. Each	**$1.60**	**2.05**	**2.40**

115M8 Crucibles, Fused Silica, Low Form, Transparent. Same shape as 115M2, otherwise identical with 115M6.

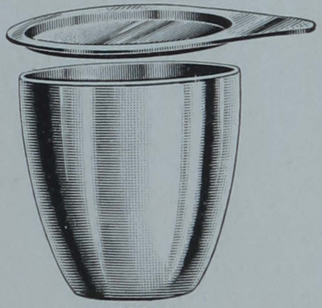
Capacity, ml.	**15**	**25**	**40**
Diameter, rim, inches	1⅝	1⅞	2¼
Height, inches	1	1⅛	1 7/16
Each, without covers	**$2.50**	**3.15**	**4.70**
115M9 Covers, Only. Each	**$2.00**	**2.50**	**3.75**



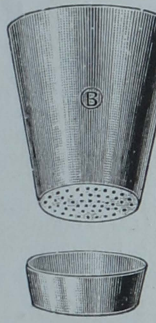
115M10

115M10 Crucibles, Iron. Made of Armco Iron drawn into shape. Especially for alkali or peroxide fusions such as in chrome ore analysis. "Armco" is practically free from chromium, silicon, and manganese. Due to its low manganese content, it is particularly suitable for use in the analysis of manganese ore.

Capacity, ml.	**20**	**30**	**50**	**100**	**200**	**400**
Diam. inside, top, in.	1½	1¾	2⅛	2½	3⅛	3¾
Depth, inside, inches	1¼	1⅜	1 7/16	2	2 5/16	3
Each, without cover	**$ .12**	**.15**	**.15**	**.18**	**.22**	**.26**
115M11 Covers Only. Each	**$ .05**	**.05**	**.05**	**.06**	**.08**	**.09**



115M12



115M15

115M12 Crucibles, Nickel. Remarkably resistant to the action of air, water, and most acids, a wide variety of salts, organic compounds, and other corrosive media. Ideal for making caustic fusions of ores, salts, and alkalies in the presence of sodium peroxides.

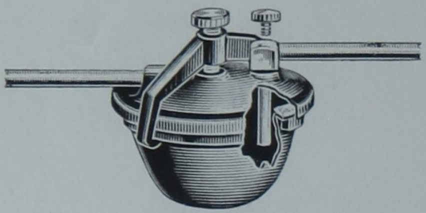
Capacity, ml.	**20**	**30**	**50**	**75**	**100**	**250**	**500**
Diam., inside, top, mm.	37	42	45	51	60	83	102
Height, inside, mm.	35	45	51	57	64	83	92
Each, without cover	**$ .32**	**.45**	**.80**	**.90**	**1.00**	**2.30**	**3.25**
115M13 Covers, Only. Each	**$ .15**	**.25**	**.30**	**.35**	**.45**	**.85**	**1.25**

115M14 Crucibles, Silver. Made from heavy pure sheet silver.

Capacity, ml.	**20**	**30**	**50**	**75**	**100**
Diameter, inside, top, mm.	37	42	45	51	60
Height, inside, mm.	35	45	51	57	64
Each, with covers	**$3.50**	**4.65**	**6.10**	**7.90**	**10.70**

115M15 Crucibles, Gooch, Nickel. Heavy pure sheet nickel, highly polished outside; inside sanded bright. Bottom perforated for filtering. Includes nickel cup, but no cover. Capacity, 30 ml. Height, 1½ inches (38 mm.). Top diameter, 1½ inches (38 mm.). Bottom diameter, 15/16 inches (24 mm.). **Each** **$1.75**

Crucibles, Continued



116M1

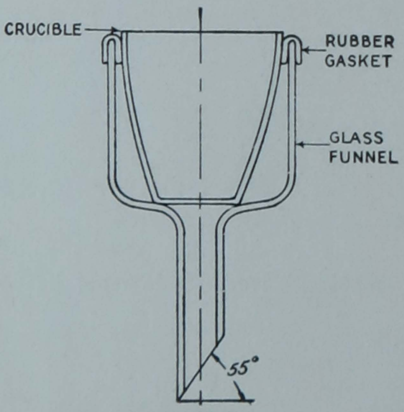
116M1 Crucibles, Skidmore, Armco Iron. Combination retort and crucible; adapted to reactions not affected by hot iron, such as the destructive distillation of organic matter, preparation of ammonia, oxygen from manganese dioxide, etc. Body is seamless, with cast iron ring around rim. Delivery tubes of brass, 6 inches long. Capacity, 40 ml.; diameter, top, inside, $2\frac{3}{16}$ inches (55 mm.); depth, inside, $1\frac{1}{2}$ inches (38 mm.). **Each** **$1.50**

116M2 Crucibles, Skidmore, Armco Iron. Same as 116M1, except larger. Capacity, 170 ml.; diameter, top, inside, $3\frac{1}{16}$ inches (78 mm.); depth, inside, $2\frac{1}{8}$ inches (54 mm.). **Each** **$2.25**

116M3

Crucibles Filter, Alundum. May be used an indefinite number of times. Cleaned by reverse washing and ignition in the usual manner. Supplied in four degrees of porosity: dense, RA 84; medium, RA 360; coarse, RA 98; and extra coarse, RA 766.

Capacity, ml.	**25**	**35**
Diameter, inches	$1\frac{3}{8}$	$1\frac{5}{8}$
Height, inches	$1\frac{1}{2}$	$1\frac{11}{16}$
116M3 Dense. Each	**$ .35**	**.45**
116M4 Medium. Each	**$ .35**	**.45**
116M5 Coarse. Each	**$ .35**	**.45**
116M6 Extra Coarse. Each	**$ .35**	**.45**

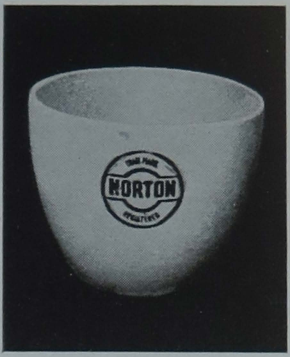


116M7

Crucible Filter Funnels, Glass. Used for supporting alundum crucibles 116M3 to 116M6, inclusive.

116M7 Funnels. For 25 ml. crucibles. **Each** .... **$ .60**

116M8 Funnels. For 35 ml. crucibles. **Each** .... **$ .70**



116M9

116M9 Crucibles, Alundum, Ignition. Used in general laboratory practice where an ignition of carbonaceous material is involved. Made of a dense mixture, RA 84, which has porosity of 36.9%.

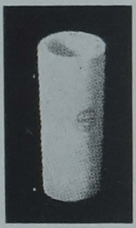
Capacity, ml.	**10**	**12**	**20**	**25**	**30**	**40**
Diam., top, inches	$1\frac{1}{16}$	$1\frac{1}{16}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{7}{8}$
Height, inches	$1\frac{3}{32}$	$1\frac{1}{4}$	$1\frac{3}{16}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{5}{8}$
Each	**$ .35**	**.35**	**.35**	**.40**	**.40**	**.40**

116M10 Crucible Covers. For 20 ml. crucibles. **Each . $ .45**

116M11 Crucible Covers. For 40 ml. crucibles. **Each . $ .45**

Note: For ignition capsules, see page 68.

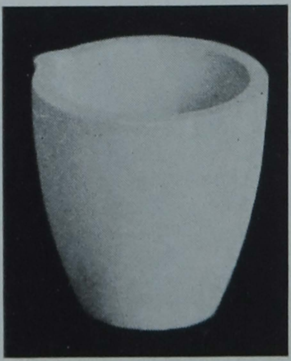
116M12



116M13

116M12 Crucibles, Melting, Alundum. Without lip. Satisfactory for melting pure metals, especially those with high melting points. Cannot be used in contact with slags on account of the absorbent nature of the refractory material. Diameter, top, $1\frac{1}{2}$ inches. Height, 2 inches. Made of a dense mixture, RA 84, which has porosity of 36.9%. **Each** **$1.40**

116M13 Crucibles, Melting, Alundum. Without lip. Arsem type, containing 99% of electrically fused alumina. Especially adapted for melting platinum. Diameter, top, $1\frac{3}{8}$ inches. Height, $3\frac{1}{4}$ inches. Made of medium mixture, RA 221. **Each** **$1.40**

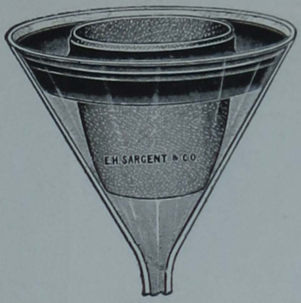


116M14

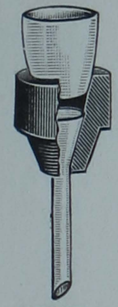
116M14 Crucibles, Melting, Alundum. With lip. Diameter, top, $2\frac{3}{8}$ inches. Height, $2\frac{5}{8}$ inches. Made of dense mixture, RA 84, which has porosity of 36.9%. **Each** . . **$1.75**

Crucibles, Continued

117M1



117M2



117M5

117M1 Crucibles, Kawin, Nickel. Made of pure, heavy nickel. For burning off filter paper in silicon determinations of iron and steel. Flat bottom and sloping sides. Polished outside. Capacity, 5 ml. Depth, 19/32 inches (15 mm.). Diameter, top, 1 9/64 inches (28 mm.). Diameter, bottom, ¾ inches (22mm.). **Each**........ **$ .45**

Crucible Holders, Sargent. For holding the usual filtering crucibles such as Gooch, Caldwell, alundum and fritted glass bottom crucibles. Permits the unobstructed use of the entire sides and bottoms of porous filters, as it grasps only about 3 mm. of the upper rim of the crucible. Will fit any ordinary 60° funnel. Made of one piece of soft rubber, with a thin rubber flange on outside rim to fit properly the glass funnel, and a similar rim on inner periphery fitting the crucible.

117M2 Crucible Holders. For crucibles of top diameter 28 to 30 mm. **Each**........ **$ .35**

117M3 Crucible Holders. For crucibles of top diameter 32 to 36 mm. **Each**........ **$ .40**

117M4 Crucible Holders. For crucibles of top diameter 36 to 41 mm. **Each**........ **$ .50**

117M5 Crucible Holders, Walter. For holding filtering crucibles in the neck of suction flasks. Consists of a circular molded rubber cylinder having a conical opening 28 mm. top diameter and tapering toward the bottom. Lower section, containing a specially designed small glass funnel, is a tapered centering section 24 mm. in diameter at the bottom and 28 mm. at the top. Holder will take Gooch or Caldwell crucibles from 35 to 40 mm. top diameter and can be used in suction flasks of capacities from 250 to 1000 ml. **Each**........ **$ .25**

117M6 Funnels, Only. For 117M5. **Each**........ **$ .10**

Crucibles, Assaying

117M7

117M7 Crucibles, Clay, Utah Brand. High quality assay crucibles of selected clay.

Size, grams	**5**	**10**	**12**	**15**	**20**	**25**	**30**	**35**	**40**
Capacity, ml.	70	100	130	140	180	230	280	290	400
Height, overall, inches	2⅝	3	3¼	3½	3¾	4	3⅞	4⅝	5⅝
Diameter top, outside, inches	2⅜	2⅝	2¾	2⅞	3⅛	3¼	3½	3⅜	3⅝
Quantity in case	100	100	100	100	100	100	64	48	48
Weight, case, pounds	27	41	44	47	55	65	48	37	57
Hundred	**$4.15**	**4.50**	**4.85**	**5.40**	**6.00**	**6.55**	**7.60**	**9.35**	**12.60**

Discount in one-case lots, 10%; in 10-case lots, 15%.

117M8 Covers, Only. For 117M7 crucibles.

For crucibles, grams	5	10	12	15	20	25	30	35	40
Hundred	**$3.00**	**3.00**	**3.60**	**3.60**	**4.75**	**4.75**	**4.75**	**4.75**	**4.75**

117M9 Crucibles, Clay, Denver Brand. High quality assay crucibles of selected clay.

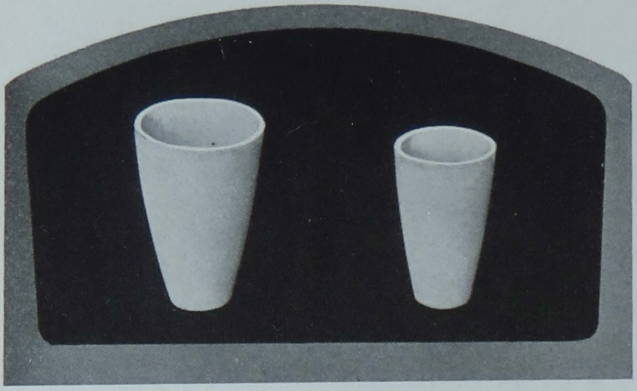
Size, grams	**5**	**10**	**12**	**15**	**20**	**25**	**30**	**35**	**40**
Height, inches	2⅝	3	3⅛	3½	3 15/16	4	4	4¾	5⅝
Diameter top, inches	2⅜	2⅝	2¾	2⅞	3 3/32	3¼	3½	3¼	3⅝
Quantity in case	175	150	112	112	96	96	80	80	48
Weight, case, pounds	62	70	64	68	69	72	69	75	66
Hundred	**$4.15**	**4.50**	**4.85**	**5.40**	**6.00**	**6.55**	**7.60**	**9.35**	**12.60**

Discount in one-case lots, 10%; in 10-case lots, 15%.

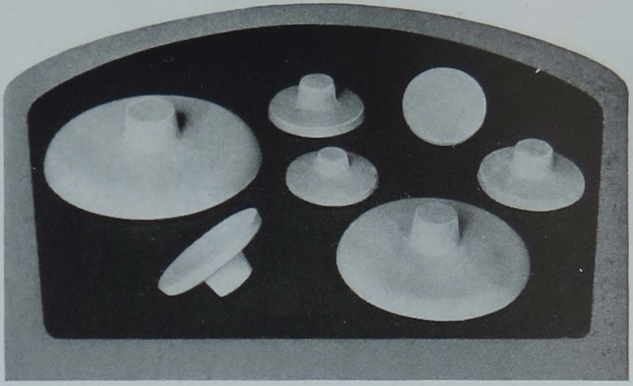
117M10 Covers, Only. For 117M9 crucibles.

For crucibles, grams	5	10	12	15	20	25	30	35	40
Hundred	**$3.00**	**3.00**	**3.60**	**3.60**	**4.75**	**4.75**	**4.75**	**4.75**	**4.75**

Crucibles, Continued



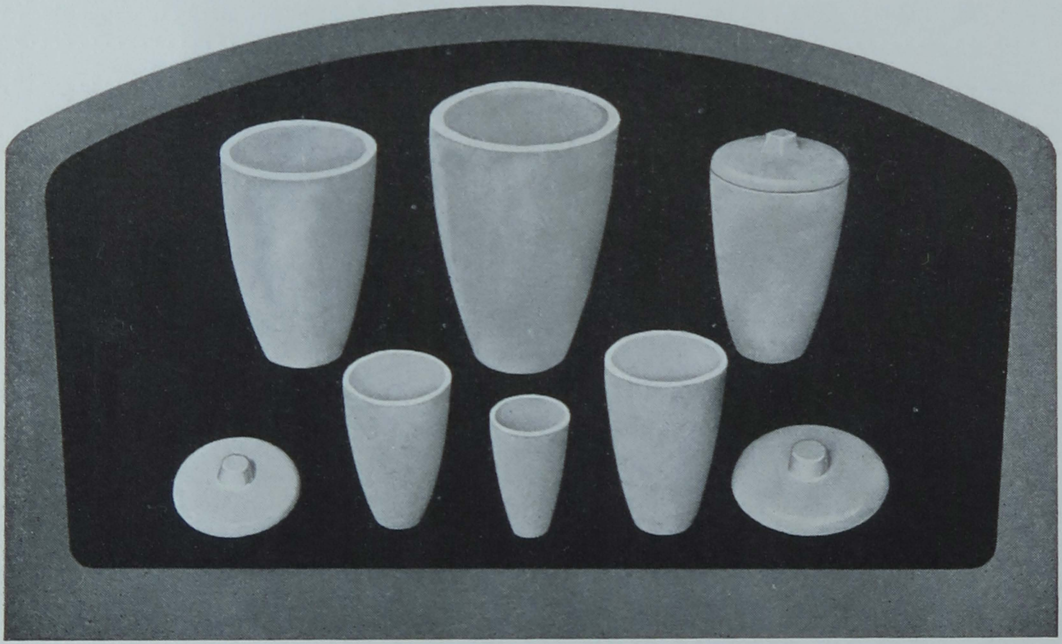
118M1



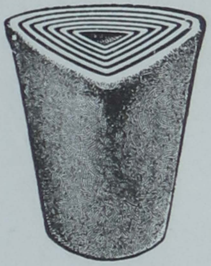
118M2

118M1 Crucibles, Clay, Tall Form. Well adapted for open fire gas or gasoline furnaces where the flame comes in direct contact with the crucibles. Also largely used for bullion.

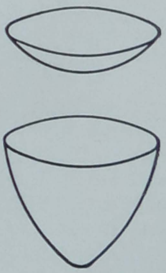
Size	**D**	**F**	**9**
Height, inches	4	5	5¾
Diameter, top, inches	2⅜	3⅛	3
Quantity in case	110	80	64
Weight, case, approximate net pounds	48	65	52
Weight, case, approximate gross pounds	54	72	59
Hundred	**$5.40**	**10.00**	**10.80**
118M2 Crucible Covers, Hundred	**$3.00**	**4.75**	**4.75**



118M3



118M5



118M6

118M3 Crucibles, Clay, Melting. Of exceptional refractory qualities, with mechanical strength, density and heat conductivity.

Size	**G***	**I**	**J**	**K**	**L**	**N**	**O**	**P****	**Q****
Height, inches	5⅝	6	6⅜	7¼	8	9⅛	9⅞	11	12½
Diameter, top, inches	3⅝	4	4½	4¾	5¼	6½	7	7¾	9
Capacity, approximate quarts	¼	½	¾	1	1¼	2¼	3	4	5
Quantity in barrel	...	115	75	50	35	32	22	....	....
Weight, gross pounds	64	205	194	175	155	290	270	....	....
Hundred	**$12.60**	**18.00**	**22.00**	**30.00**	**42.00**	**70.00**	**100.00**	**120.00**	**160.00**

*G crucibles are packed in cases of 48. **P and Q crucibles are packed in boxes made to fit order.

118M4 Crucible Covers	G	I	J	K	L	N	O	P	Q
Hundred	**$ 7.10**	**9.90**	**12.30**	**12.30**	**13.20**	**19.80**	**23.10**	**26.40**	**29.70**

118M5 Crucibles, Hessian Sand. Triangular, in nests.

Quantity in nest	**3**	**5**
Height, largest, inches	4	4½
Width, top inches	3	3¾
Nest	**$ .30**	**.50**

118M6 Crucibles, Clay Capsules. For blowpipe work. **Dozen** .... **$ .50**

Crucibles, Continued

119M1

119M1 Crucibles, Graphite, Dixon. Especially suitable for high temperature work. Made of a mixture of graphite and clay so naturally absorbs moisture as readily as a sponge. This moisture must be driven out slowly before crucibles are used. Crucibles should be handled carefully at all times, and particularly so when annealing on the first heat. Should be unpacked as soon as received and stored in a warm, dry place. Ideal storage oven is one in which crucibles can be stored on open shelves away from cement or earthen floors at a temperature of not less than 250° F.

Before annealing, crucibles should be preheated for at least a number of hours by placing them near furnace at some place where they will be heated to a temperature above 212° F. (the steam point). Should be annealed slowly.

Metal should be so placed in crucibles as to avoid possible wedging. When heated the metal expands much more than does the crucible, so that if metal is wedged it will crack the crucibles. Tongs and shanks should fit properly to eliminate unnecessary abuse and squeezing the crucibles, which causes cracks and leaks.

For the larger sizes, it is well to use a tilting furnace (see page 185) which does away with the use of tongs.

Size	**0**	**00**	**000**	**0000**	¼	½	**1**	**1¼**	**1½**	**1¾**	**2**
Capacity, approximate pounds water	1/32	2/32	4/32	5/32	7/32	12/32	½	9/16	⅝	5/16	¾
Capacity, cubic inches	.86	1.73	3.46	4.33	6.06	10.39	13.85	15.57	17.35	8.67	20.75
Capacity, pounds brass	.276	.553	1.120	1.385	1.935	3.320	4.430	4.980	5.500	2.770	6.650
Diameter top, outside, inches	1½	1 13/16	2	2⅜	2⅝	3	3¼	2⅞	3 9/16	3	3¾
Diameter bilge, outside, inches	1½	1 13/16	1 15/16	2⅜	2⅝	3	3⅛	2⅞	3¾	3	3 11/16
Diameter bottom, outside, inches	1 3/16	1⅜	1½	1¾	2	2⅛	2¼	2¾	2½	2	2⅞
Height, outside, inches	2	2¼	2 9/16	2 15/16	3¼	3¼	3⅝	3⅞	4 1/16	4¼	4½
Each	**$ .50**	**.50**	**.50**	**.50**	**.60**	**.60**	**.65**	**.65**	**.70**	**.75**	**.75**

Size, continued	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**12**	**14**	**16**
Capacity, approximate pounds water	1	1½	1¾	2¼	2½	3	3½	3 13/16	4	4.8	5.5
Capacity, cubic inches	27.70	41.50	48.40	62.30	69.30	83.20	96.85	105.30	113	132	151
Capacity, pounds brass	8.860	13.250	15.50	19.95	22.20	26.60	30.98	33.60	36	42	48
Diameter top, outside, inches	4¼	4⅝	4⅞	5¼	5½	5⅞	5⅞	6 1/16	6⅜	6 11/16	6 15/16
Diameter bilge, outside, inches	4⅛	4 9/16	4⅞	5¼	5½	5⅞	6¼	6 9/16	6⅞	7 3/16	7½
Diameter bottom, outside, inches	3	3⅛	3½	3⅞	4	4¼	4¾	4 15/16	5 1/16	5¼	5½
Height, outside, inches	5⅜	5¾	6⅛	6½	6¾	7⅛	7⅝	8 1/16	8½	8⅞	9¼
Each	**$ 1.00**	**1.25**	**1.35**	**1.60**	**1.90**	**2.00**	**2.15**	**2.30**	**2.40**	**2.52**	**2.88**

Size, continued	**18**	**20**	**25**	**30**	**35**	**40**	**45**	**50**	**60**	**70**	**80**
Capacity, approximate pounds water	6.1	6.8	8.5	10.1	11.8	13.6	15	17	20.4	23.7	27
Capacity, cubic inches	169½	188½	235½	282	329½	377	423½	471	565	658½	753
Capacity, pounds brass	54	60	75	90	105	120	135	150	180	210	240
Diameter top, outside, inches	7 5/16	7 11/16	8 3/16	8⅝	9	9⅜	9⅞	10¼	10 13/16	11¼	11 11/16
Diameter bilge, outside, inches	7 15/16	8⅜	8⅞	9 5/16	9¾	10⅛	10 11/16	11⅛	11 11/16	12 3/16	12 11/16
Diameter bottom, outside, inches	5 13/16	6⅛	6½	6 13/16	7⅛	7 7/16	7 13/16	8⅛	8 9/16	8 15/16	9¼
Height, outside, inches	9 13/16	10 5/16	10 15/16	11½	12	12½	13 3/16	13¾	14 7/16	15 1/16	15⅝
Each	**$ 3.06**	**3.20**	**3.50**	**4.20**	**4.90**	**5.60**	**6.30**	**7.00**	**8.40**	**9.80**	**11.20**

Size, continued	**90**	**100**	**125**	**150**	**175**	**200**	**225**	**250**	**275**	**300**	**400**
Capacity, approximate pounds water	30.5	34	42.5	51	59	67.7	76.5	85	93.5	102	139
Capacity, cubic inches	847	942	1177	1412	1645	1882	2120	2355	2590	2825	3765
Capacity, pounds brass	270	300	375	450	525	600	675	750	825	900	1200
Diameter top, outside, inches	12⅛	12½	13	13¾	14⅜	15	15½	16	16 7/16	16⅞	18 3/16
Diameter bilge, outside, inches	13⅛	13½	14 1/16	14⅞	15 9/16	16¼	16 13/16	17 5/16	17 13/16	18¼	19 11/16
Diameter, bottom, outside, inches	9 9/16	9⅞	10 5/16	10⅞	11⅜	11⅞	12 5/16	12 11/16	13	13⅜	14 7/16
Height, outside, inches	16 3/16	16 11/16	17⅜	18⅜	19¼	20	20¾	21⅜	22	22½	24 5/16
Each	**$12.60**	**14.00**	**17.50**	**21.00**	**24.50**	**28.00**	**31.50**	**35.00**	**38.50**	**42.00**	**56.00**

Note. Capacities given are actual total, not working, capacities. Working capacity is variable and may be from 70 to 90 per cent of those given. Total capacity in pounds of metal depends on the specific gravity, and may be found approximately by multiplying the total capacity in pounds of water by the specific gravity of the metal.

119M2 Crucible Covers, Graphite. For 119M1.

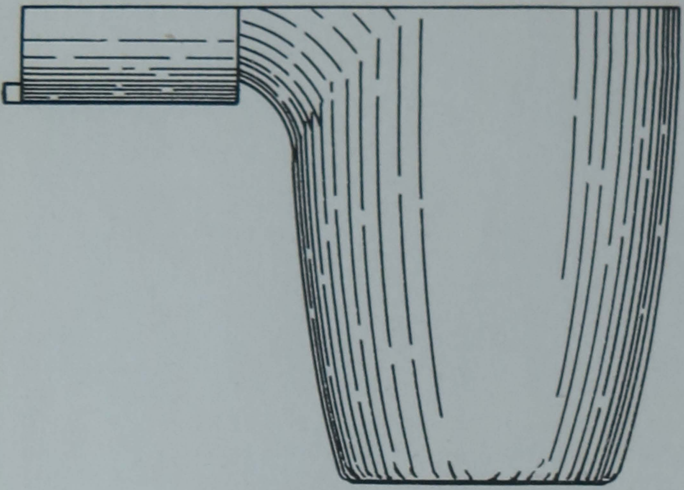
Size	0 to 0000	¼ to 5	6 to 10
Each	**$ .25**	**.30**	**.35**

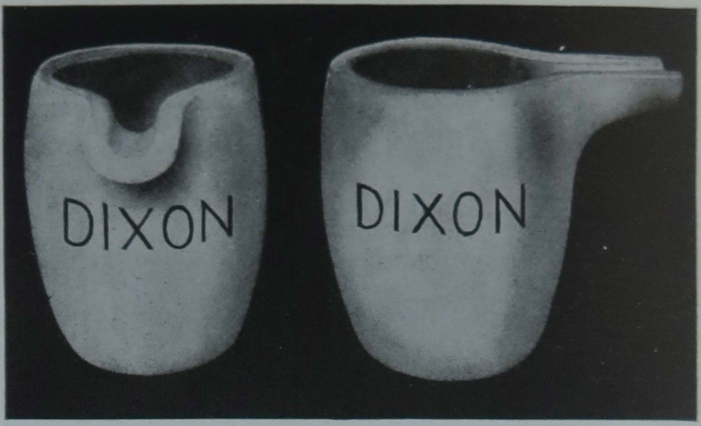
Size Numbers 12 to 400, inclusive. **Each Number** . . . . **$ .04**

119M3 Crucibles, Graphite, Clay Lined. Same as 119M1, except lined with clay. Furnished on special order only.

Size	40	60	80	100	125	150	275
Each	**$6.00**	**9.00**	**12.00**	**15.00**	**18.75**	**22.50**	**41.25**

Crucibles, Continued


120M1



120M4

120M1 Crucibles, Graphite, Case Lip, Dixon. For 185M4 tilting oil fired furnaces. Furnished without trough.

Size	**40**	**60**	**80**	**125**	**150**	**275**
Height, outside, inches	13	15	15⅞	17⅜	18¼	23¼
Diameter, top, outside, inches	10⅛	11½	12⅝	13¾	14¾	16¾
Diameter, top, inside, inches	8⅜	9½	10½	11⅝	12½	14¼
Diameter, bottom, outside, inches	7¾	8¼	8⅝	9⅝	10½	12¾
Top, including lip, inches	12¼	13⅝	14⅞	16¼	18	19⅞
Depth, lip, outside, inches	2½	2½	2½	2½	2½	2½
Width, lip, inches	4½	4½	4½	5¼	5¼	5¼
Each, Without Trough	**$6.00**	**9.00**	**12.00**	**18.75**	**22.50**	**41.25**
120M2 Crucibles, Graphite, Case Lip, Dixon. Same as 120M1 except **with clay lining. Each**	**$6.40**	**9.60**	**12.80**	**20.00**	**24.00**	**44.00**
120M3 Crucible Troughs, Graphite. For 120M1. **Each**	**$1.25**	**1.25**	**1.25**	**1.75**	**1.75**	**1.75**

120M4 Crucibles, Graphite, Extended Lip, Dixon. For tilting crucible furnaces. Lip of sufficient length, for most furnaces, to eliminate need of separate trough. Suitable for Steele-Harvey and Monarch tilting furnaces.

Size	**40**	**60**	**125**	**150**	**200**	**225**	**275**
Height, inches	12½	14 7/16	17⅜	18⅜	20	20¾	22
Diameter, top, inches	9⅜	10 13/16	13	13¾	15	15½	16 7/16
Diameter, top, including lip, inches	14⅜	16½	19⅞	21⅜	22¾	23⅜	24¼
Diameter, bottom, inches	7 7/16	8 9/16	10 5/16	10⅞	11⅞	12 5/16	13
Diameter, bilge, inches	10⅛	11 11/16	14 1/16	14⅞	16¼	16 13/16	17 13/16
Length, lip, inches	5	5 11/16	6⅞	7⅝	7¾	7⅞	7 13/16
Width, lip, inches	3¾	3¾	5	5	5	5½	5½
Each	**$6.00**	**9.00**	**18.75**	**22.50**	**30.00**	**33.75**	**41.25**
120M5 Crucibles. Same as 120M4, except **with clay lining. Each**	**$6.40**	**9.60**	**20.00**	**24.00**	**32.00**	**36.00**	**44.00**

120M6

120M7

120M6 Crucible Stools, Graphite. Bases; for tilting furnaces. **Heart Shape.**

Size	**40**	**60**	**80**	**90**	**125**	**150**	**275**
Height, inches	4	4	4½	4½	4½	4½	4½
Length, inches	9⅜	9⅝	9½	11¼	11½	12½	14½
Width, inches	7¾	8	8	9¼	9½	10⅜	12
Each	**$1.50**	**1.70**	**1.70**	**2.00**	**2.50**	**3.50**	**4.25**

120M7 Crucible Stools. Same as 120M6, except **Round Shaped.**

Size	**40**	**60**	**80**	**125**	**150**	**225**	**275**
Height, inches	8	8	8	9	9	10	10
Diameter, top, inches	7½	9	9	9	10	12	12
Diameter, bottom, inches	5½	7	7	7	7	7	7
Each	**$1.90**	**2.50**	**2.50**	**2.80**	**3.20**	**4.25**	**4.25**

120M8 Crucible Stirrers, Graphite. Black Lead. Length, 9 inches, Mint size. **Each**	**$ .50**
120M9 Crucible Stirrers, Graphite. Black Lead. Length, 14½ inches. **Each**	**$ .75**

Crucibles, Continued

121M1

121M1 Crucibles, Tercod, Standard Lip. Made from silicon carbide, graphite and carbon bond. No clay bond is used.
Do not require any drying or annealing. This eliminates the necessity of carrying large stocks.
High temperatures will not reduce the life of the tercod crucible. Indeed, they tend to increase it.
Gas or oil flames do not injure tercod crucibles.
Rapid cooling or heating will not crack the pot.
Tercod crucibles are made of a compound which is a high conductor of heat. This saves fuel and increases production.
Fluxes used in melting copper, brass, silver or gold have no effect on tercod crucibles.
The walls of tercod crucibles do not get thinner. This eliminates loss of metal due to cracking.
The cost per heat will be greatly reduced. The result of efficiency is always maximum economy.

Size	**5**	**10**	**14**	**20**	**25**	**30**	**35**	**40**	**45**	**50**	**60**	**65**
Capacity, water pounds	2	4.5	7	10	11	13	15	19	21	25	29	31
Height, inches	5½	8¼	9½	10⅝	10⅞	11½	12½	12⅞	13¾	14¼	14¾	15⅝
Diameter, top, inches	5⅜	6¼	7⅛	7⅝	8¼	8⅝	9¼	9½	9⅞	10¼	10⅞	10⅝
Bilge, inches	....	6¾	....	8⅝	9	9⅞	9⅞	10⅜	11	11⅜	12	12⅛
Bottom, inches	4⅜	5	6½	5⅜	6	6⅝	6⅞	8¼	8⅛	8¼	9	8⅞
Each	**$2.00**	**2.60**	**2.80**	**3.50**	**4.00**	**4.80**	**5.60**	**6.40**	**7.20**	**8.00**	**9.60**	**10.40**

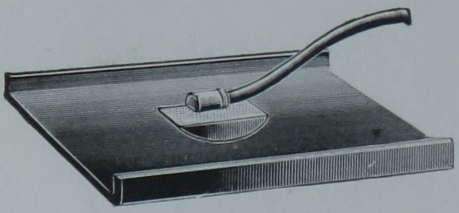
Size, continued	**70**	**80**	**90**	**100**	**125**	**150**	**175**	**200**	**225**	**250**	**275**	**300**
Capacity, water pounds	32	35	37½	46	51	59	68	81	92	105	110	118
Height, inches	15⅝	16¼	17¾	17½	17⅜	19¼	19⅞	20¾	21½	21¾	23⅛	23½
Diameter, top, inches	11¼	11⅞	12¼	12⅝	13⅛	13⅞	14½	15⅜	15⅞	16¼	17	16⅞
Bilge, inches	12⅜	13	13⅝	14	14¾	15⅛	15⅞	16⅞	17⅜	17⅞	18	18⅜
Bottom, inches	9	9¾	8⅞	10¼	10¼	10¼	10¾	12½	13	13	12⅜	13⅛
Each	**11.20**	**12.80**	**14.40**	**16.00**	**20.00**	**24.00**	**28.00**	**32.00**	**36.00**	**40.00**	**44.00**	**48.00**

121M2 Crucibles, Tercod, Long Lip. For use with tilting furnaces. Specifications same as 121M1. Complete with detachable trough (lip).

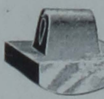
Size	40	60	80	125	150	275
Each	**$6.40**	**9.60**	**12.80**	**20.00**	**24.00**	**44.00**
121M3 Extra Troughs. Each	**$1.35**	**1.35**	**1.35**	**1.35**	**1.35**	**1.35**

Note: Tercod silicon carbide crucibles can be supplied with a fused alumina lining. Also lined with fused magnesia, fused mullite and carbon to meet special requirements. Price on special crucibles furnished upon request.

Crushers and Pulverizers



122M1



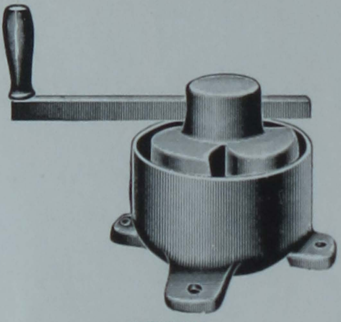
122M2

122M1 Crushers, Buckboard and Muller. Smooth grinding surface, with sides. Complete with muller of size shown, with handle.

Size, inches	**12x18**	**20x24**	**24x36**	**30x36**
Muller weight, pounds	15	20	25	35
Complete	**$10.00**	**20.00**	**35.00**	**40.00**

122M2 Mullers. For 122M1. With hickory handle.

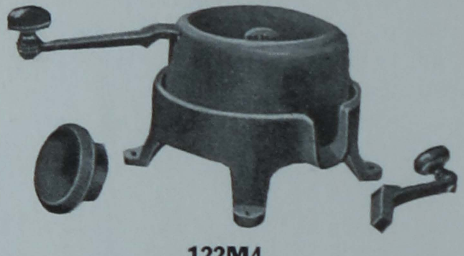
Weight, pounds	15	20	25	35	50
Each	**$3.75**	**4.00**	**4.50**	**5.00**	**5.50**



122M3

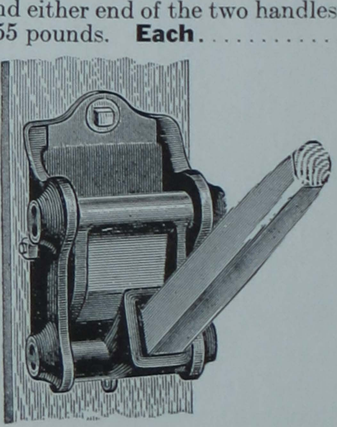
122M3 Crushers, Rotary Mortar. For grinding and amalgamating. By the rotation of the muller a large sample of ore may be ground: also, may be ground with quicksilver. Made of iron.

Diameter, inches	6½	8½
Muller weight, pounds	16	49
Total weight, pounds	30	76
Each	**$9.00**	**15.00**



122M4

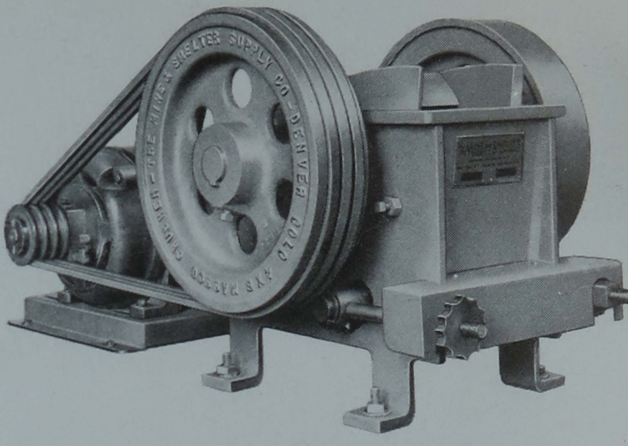
122M4 Crushers, Weatherhead's Pulverizer. For pulverizing any coarse materials such as ores, pig iron, rock, clay and coal to fine powder. Also used for amalgamating. Discharges material as soon as pulverized, and is cleaned easily. The cover of the crusher may be used as a small hand mortar and either end of the two handles as a pestle. Shipping weight, 155 pounds. **Each** **$35.00**



122M5

122M5 Crushers, Prospector, Ore. A lever operated eccentric actuates the movable jaw. The fineness of the discharged material depends upon the distance the lever is moved.

Fastens to post with one screw. Jaw opening, 2x3½ inches. Weight, 20 pounds. **Each** **$10.00**



122M8

Crushers, Laboratory, Massco. A welded steel frame crusher that is light in weight and compact, but with ample strength for heavy duty, steady crushing. This crusher is easily cleaned and the wearing parts are accessible and quickly replaced. An improved crushing stroke makes it ideal for general laboratory work.

The swinging jaw has a combination forward and downward stroke exerting the maximum motion and power on the coarse material. This downward motion forces out a product which is ideal for pulverizer feed and is free from excessive, oversize material. On damp ores, this type of stroke greatly increases the crusher capacity over those not having this feature.

A handwheel, convenient to the operator, provides means of operating the side rods to adjust the crusher opening evenly. There is no need for a wrench or shims to change the size of the finished product or to compensate for jaw plate wear. A hinged steel guard covers the eccentric motion from dirt and foreign material. This crusher has no toggles to break or drop out.

All jaw and cheek plates are manganese steel. The swinging jaw plate is held in place by two large clamps. Both jaw plates are easily reversed, top to bottom, to provide maximum use as the bottoms wear.

Cheek plates are of the wedge type and hold the stationary jaw plate in place, and they, in turn, are held in place by large set screws to prevent working out. Cheek plates are interchangeable for use on either the right- or left-hand side.

The oversize steel crank shaft and the swinging jaw are carried on Pear-O bronze bushings, lubricated by alemite fittings and easily replaced when necessary.

Size, inches	4x6
Speed, R. P. M.	375
H. P. required	2 to 3
Maximum opening of plates, inches	¾
Capacity, dry limestone, pounds per hour:	
with ¼-inch opening	600-1200
with ½-inch opening	1200-2400
Weight, shipping, pounds	435

122M6 Crusher. For belt drive, with tight pulley only. **Each** **$150.00**

122M7 Loose Pulley. For 122M6. When ordered with crusher, extra **$10.00**

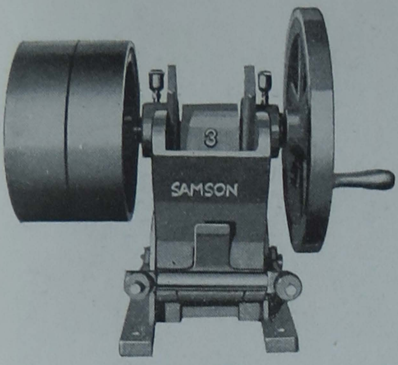
122M8 Crusher. Complete with V-belt drive and 3 H. P., 220-440 volt, 60-cycle motor. **Each** **$220.00**

122M9 Stationary Jaw Plates, Manganese Steel. Each **$4.50**

122M10 Movable Jaw Plates, Manganese Steel. Each **$4.50**

122M11 Cheek Plates (two required). **Pair** **$3.30**

Crushers and Pulverizers, Continued

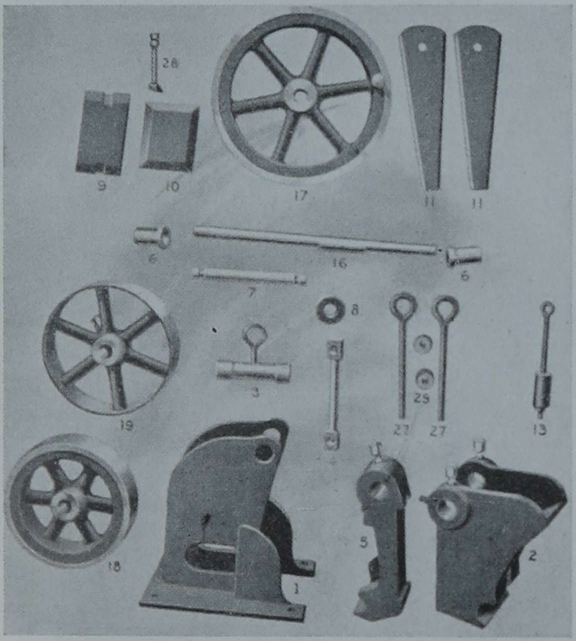


123M1

123M1 Crushers, No. 00 Samson, Laboratory. Crushes anything from the hardest rock to the softest ore. It will not choke on sticky material, crushes fine to a uniform size and the forward and downward movement of the jaws accelerates discharge and prevents clogging.

Has few moving parts, unusual durability and great strength and power. It can be instantly opened without tools for cleaning by pulling down an eye bolt and dropping front journal. Stationary jaw plate may then be turned up, exposing both jaws and side plates for cleaning. Jaw plates are manganese steel. It is simple and can be operated either by hand or belt, very little power is required.

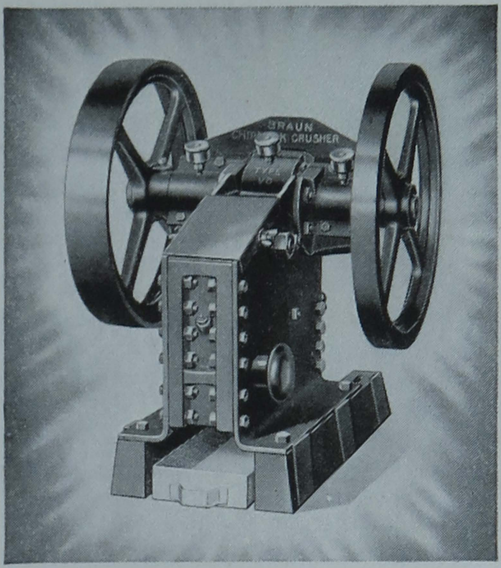
Jaw Opening Inches	Size Pulley Inches	Speed R.P.M.	Horse Power	Weight Pounds	Price With T and L Pulley
1½x4	12x3	500	1	300	**$75.00**



123M2

Repair Parts For 123M1

Part No	Description	Price
1.	Main Frame	**$15.00**
2.	Swinging Frame	**12.00**
3.	Front Oscillating Journal Seat	**3.00**
4.	Front Oscillating Journal	**3.00**
5.	Jaw	**9.00**
6.	Eccentric Shaft Journal Boxes (2). **Each**	**3.40**
7.	Rear Tie Bar Shaft	**1.50**
8.	Collar	**1.15**
9.	Movable Jaw Plate (Manganese Steel)	**3.75**
10.	Stationary Jaw Plate (Manganese Steel)	**3.75**
11.	Cheek Plates, Hard Iron (2). **Per Pair**	**1.90**
13.	Eyebolt and Spring	**3.00**
15.	Eccentric Shaft, Tight Pulley Only	**7.50**
16.	Eccentric Shaft, T and L Pulley	**8.25**
17.	Fly Wheel	**11.25**
18.	Fly Wheel Pulley	**12.75**
19.	Loose Pulley	**4.50**
23.	Tie Bar Nuts (2). **Each**	**.40**
27.	Tie Bars (2). **Each**	**1.15**
28.	Jaw Plate Bolt	**.40**



123M3

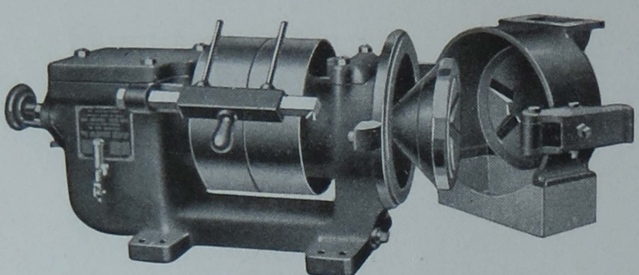
123M3 Crushers, Laboratory, Chipmunk, Braun. Frame is of heavy steel plate bolted to cast steel spacing blocks. The shaft is of alloy steel and a heavy cast steel yoke provides the bearing supports and adds strength and rigidity to the frame. Large adjusting blocks back up the stationary jaw where the shock of the crushing impact is heaviest. The adjusting mechanism consists of steel wedge blocks operated by a screw and controls the discharge opening between the jaw plates. All parts are easily accessible for cleaning by lifting the stationary jaw from its chamber which leaves the interior parts exposed.

The Type VD crusher will reduce average quartz rock from 2¼ inches down to ¼ inch at the rate of 400 pounds per hour. The Type WD crusher has about double this capacity

Type	**VD12**	**VD14**	**WD16**	**WD18**
Pulley drive	Tight	Tight & Loose	Tight	Tight & Loose
Capacity, pounds per hour	400	400	800	800
Speed, R. P. M.	400	400	400	400
H. P. required	1	1	2	2
Diameter, pulley, inches	16	16	20	20
Size, jaw, inches	6x3	6x3	9x4	9x4
Opening, jaw, inches	2¼x3	2¼x3	2⅜x4	2⅜x4
Length, overall, inches	19¼	19¼	24¼	24¼
Width, overall, inches	21¾	21¾	27¼	27¼
Height, overall, inches	21¾	21¾	28	28
Reduction, maximum inches	⅜	⅜	⅝	⅝
Reduction, minimum inches	1/16	1/16	1/16	1/16
Weight, shipping, pounds	275	315	495	540
Each	**$116.00**	**133.00**	**213.00**	**240.00**

123M4 Movable Jaw Plates. Type	VD	WD
Each	**$ .85**	**1.65**
123M5 Stationary Jaw Plates. Each	**$ .85**	**1.65**

Crushers and Pulverizers, Continued



124M1

124M1 Pulverizers, McCool. A disc-type grinder designed for grinding virtually any material, and for pulverizing to any mesh, at one operation. It is particularly adapted for the assay office, the metallurgical, chemical and industrial laboratory.

The McCool is the only self-contained laboratory grinder which has both a vertical and horizontal planetary movement. The result is that the rotating disc always has the proper angular curvature, so-called, with relation to the stationary disc.

The grinding is done between 2 discs, one of which is stationary, the other revolving eccentrically at high speed. The relation of the discs is constantly altered by the eccentric movement, hence the discs cannot groove, no matter how fine or coarse the product, but will remain smooth and deliver uniform and dependable service until worn out.

The revolving disc is attached by a ball-and-socket joint with spring tension. This enables the disc automatically to align itself with the stationary disc. The constant contact of the two discs tends to perfect the crushing efficiency.

The main shaft is hollow. Located eccentrically within it is the disc driving shaft which, through the range of gearing, has a much greater speed than the pulley speed. The resultant high speed of the rotary disc accounts in a large measure for the exceptional capacity and fineness of product of the McCool.

The adjustment of the grinding discs to each other is automatic and positive and may be made while the machine is in operation.

A self-locking device holds the hinged grinding chamber in place and affords easy and quick access to grinding chamber for removing ground samples and for cleaning.

Model 6½F, which is equipped with discs 6½ inches in diameter will reduce an 8-ounce sample of quartz to 100 mesh in 30 seconds.

Model 9½K, which is equipped with discs 9½ inches in diameter, will reduce a one-pound sample of quartz to 100 mesh in 30 seconds.

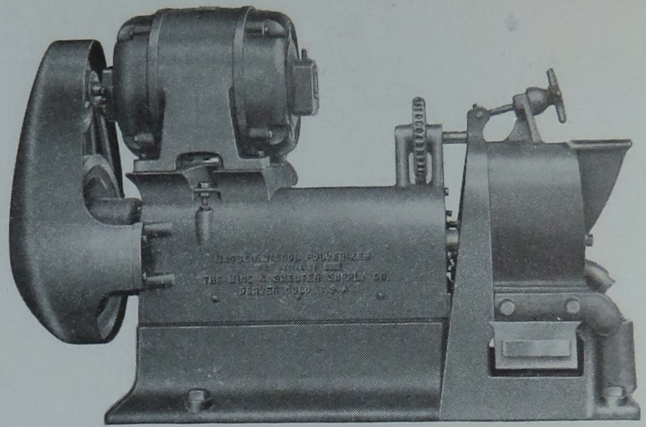
Oil is carried to every moving part by a combined ring and splash system, and the gears run noiselessly in a bath of oil. A gauge indicates the condition of the oil-supply at all times.

It is made in two sizes as follows:

Model number	6½F	9½K
H. P. required	3	5
Speed, R. P. M.	250	275
Size, pulley, inches	11x3	12x4
Length, inches	30	34
Height, inches	14½	20
Width, inches	11	15
*Capacity, pounds per hour	60	120
Weight, pounds	330	570
Each	**$150.00**	**250.00**

*¼-inch feed of hard rock to 100 mesh.

124M2 Discs. For 124M1. **Set** of two..$ **8.00** **10.00**



124M3

124M3 Pulverizers, Massco, McCool. Although utilizing the original and time-proved planetary motion of the original McCool pulverizer, the Massco McCool pulverizer has been designed to eliminate all gearing and oil leakage into the grinding chamber, to grind more pounds per hour, to produce a finer grind with one pass, and to consume less power. Maintenance, except for disc wear, and an occasional lubrication with an alemite gun, is practically eliminated.

Although 80 to 100-mesh is fine enough for most ores, 150-mesh grind is required frequently. The Massco-McCool Pulverizer has enough reserve capacity to produce this finer grind at one pass of the material. By means of a new method of holding both the rotating and stationary discs in place 150-mesh, and even finer, is obtained easily, and provides even wear of the discs with no tendency to groove.

The combined rotating and gyrating motion of the moving disc is at a speed experimentally obtained and proven best during years of building and servicing McCool pulverizers. This correct speed, maintained by the proper speed motor supplied with each machine, accounts for the increased capacity and longer disc life.

A micrometer adjustment on top of the machine near the grinding chamber lock is convenient to the operator for changing the size of the product. This adjustment is positive and self-locking. The operator no longer needs to reach around the back of the machine to make disc adjustments.

As there are no bearings inside the grinding chamber, oil leakage and contamination of the sample is impossible. A dust-collar around the rotating disc shaft seals the grinding chamber.

The interior of the chamber is cleaned easily and the danger of salting minimized. The heavy steel pan supplied with each machine likewise is cleaned easily and, in addition, can be inserted beneath the grinding chamber from either side; providing an additional convenience to the operator.

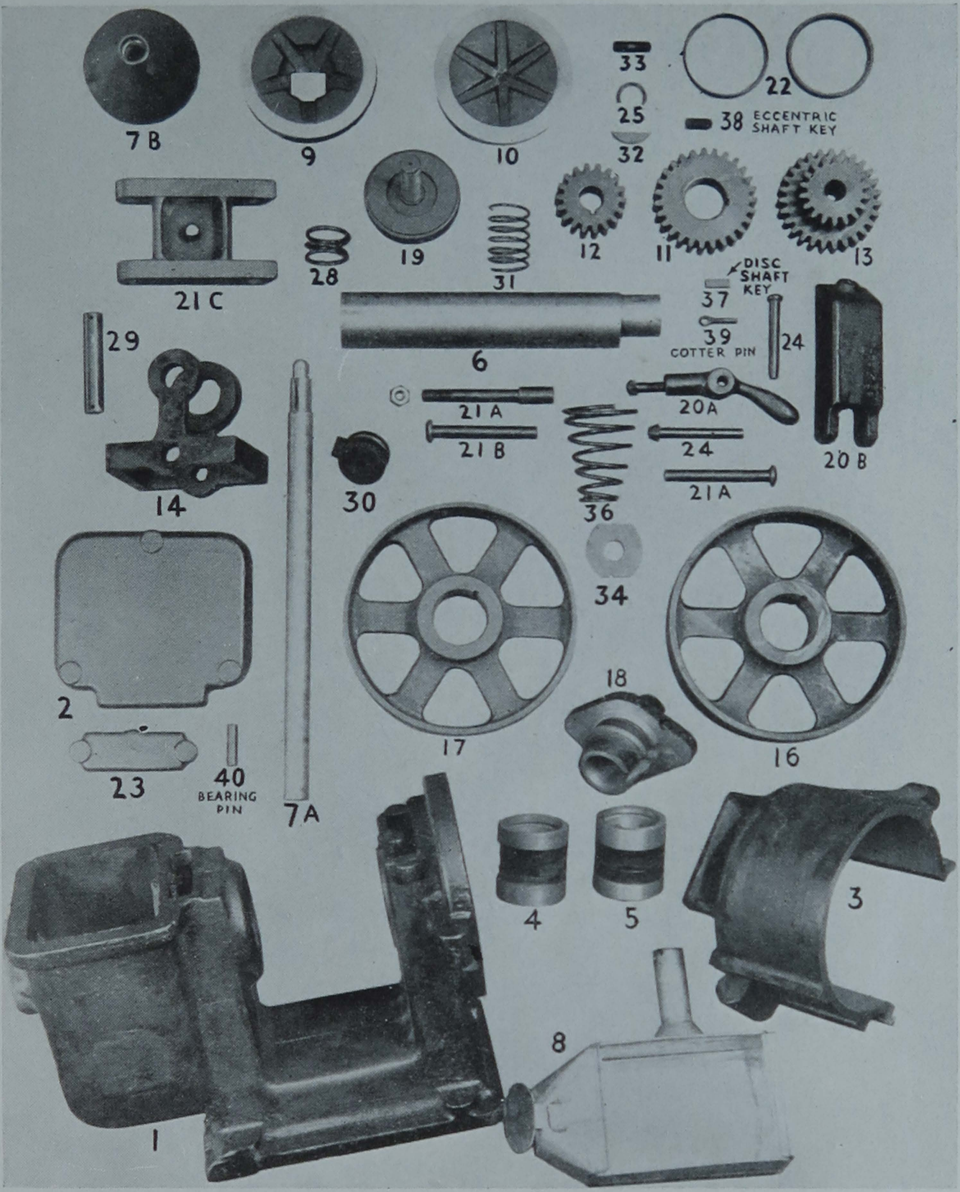
There are no gears to break or wear out on the pulverizer. Two V-belts from the motor, operating over different size sheaves, provide the power and proper R. P. M. for the rotating and gyratory motion of the disc. The disc shaft, driven by a flexible coupling with a micarta center-piece, rotates at 800 R. P. M., and at the same time travels around its own axis at 200 R. P. M. inside an eccentric outer sleeve.

Anti-friction bearings, lubricated through alemite fittings, are used throughout the pulverizer. The entire motor, shaft assembly and housing move as one unit when adjusting disc clearance. The design eliminates need of the disc shaft to slide through the bearings, and the resultant danger of such a movement carrying dirt into them. All rotating members are housed in a heavy casting which slides on a heavy base frame in dovetail slides, also protected with wipers and shields to prevent entrance of dirt.

Furnished complete with 2 H. P. motor, steel pan and one each, 9-inch, rotating and stationary discs. Dimensions: 27 inches high, 15 inches wide, and 40 inches long. Net weight, 660 pounds. Prices on application.

124M4 Pulverizers, Massco-McCool, Belt Driven. Same as 124M3, except supplied with a tight and loose pulley mounted in place of the motor. The pulley shaft is carried in self-aligning anti-friction bearings. Complete with belt shifter. Prices on application.

Crushers and Pulverizers, Continued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38 ECCENTRIC SHAFT KEY
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21C
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11
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DISC SHAFT KEY
37
39
COTTER PIN
24
29
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21A
21B
20A
24
20B
21A
14
30
36
34
2
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18
16
23
40 BEARING PIN
7A
4
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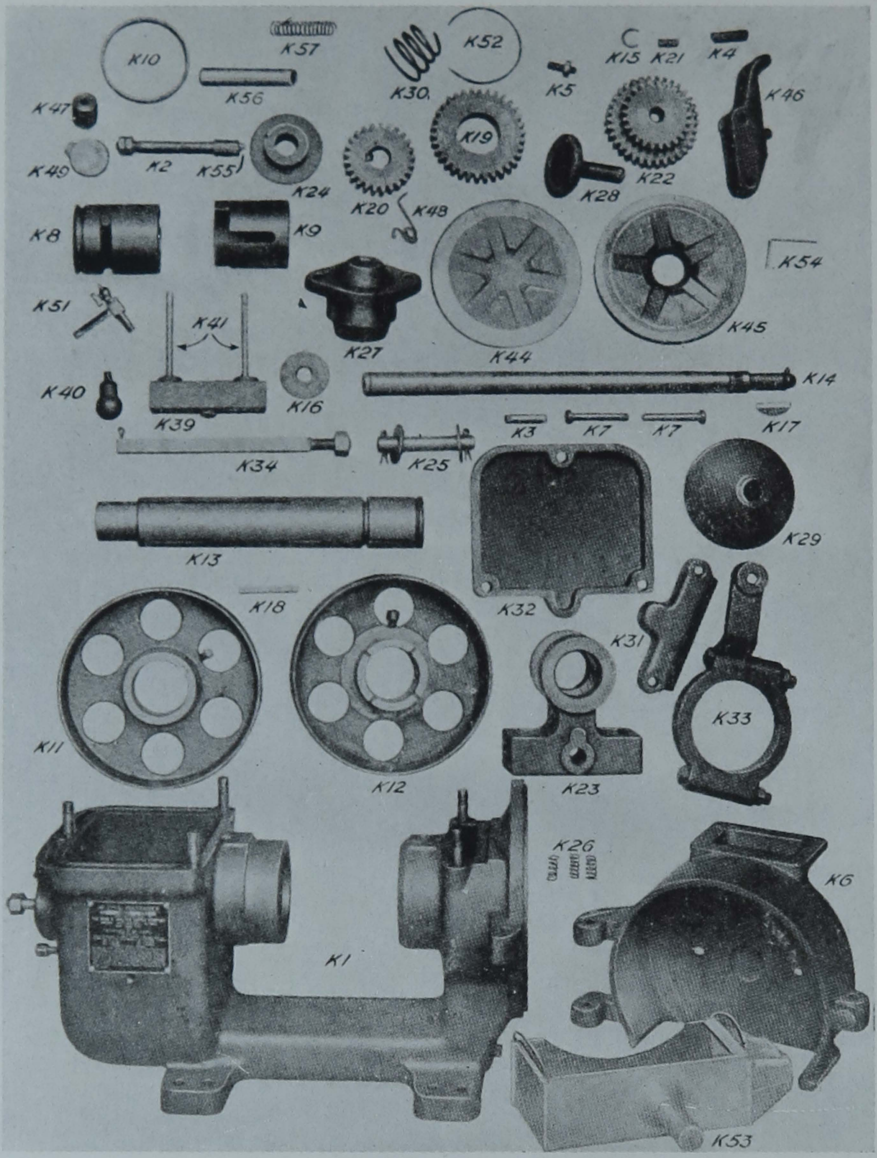
1

Repair Parts for Model 6½F McCool Pulverizer

Part No.	Description	Each
F 1	Frame	**$40.00**
F 2	Gear Cover	**2.95**
F 3	Hopper and Grinding Chamber	**13.60**
F 4	Front Bearing	**5.50**
F 5	Rear Bearing	**5.50**
F 6	Eccentric Shaft	**14.50**
F 7a	Disc Shaft	**8.25**
F 7b	Disc Driver	**7.40**
F 8	Sample Pan	**5.25**
F 9	Stationary Disc	**4.00**
F10	Rotary Disc	**4.00**
F11	Eccentric Shaft Gear	**7.80**
F12	Disc Shaft Gear	**7.20**
F13	Double Transmission Gear	**13.35**
F14	Gear Hanger	**7.20**
F16	Driving Pulley	**12.00**
F17	Loose Pulley	**12.00**
F18	Locking Thrust Bearing	**4.25**
F19	Adjusting Screw	**2.50**
F20a	Hopper Lock Handle	**3.60**
F20b	Hopper Handle Hinge	**$4.00**
F21a	Front Hopper Hinge Pin	**3.15**
F21b	Rear Hopper Hinge Pin	**.90**
F21c	Hopper Hinge	**2.50**
F22	Oil Ring	**1.00**
F23	Oil Well Cover	**.75**
F24	Hopper Lock Pin	**.50**
F25	Stop Spring for Disc Shaft	**.15**
F28	Disc Clutch Spring	**.35**
F29	Gear Hanger Pin	**1.25**
F30	Thrust Button	**2.50**
F31	Hopper Hinge Spring	**.30**
F33	Stationary Disc Stud	**.30**
F34	Disc Clutch Washer	**.30**
F36	Adjusting Screw Spring	**.65**
F37	Disc Shaft Key	**.15**
F38	Eccentric Shaft Key	**.15**
F39	Cotter Pin	**.05**
F40	Front and Rear Bearing Pin	**.25**

Crushers and Pulverizers, Continued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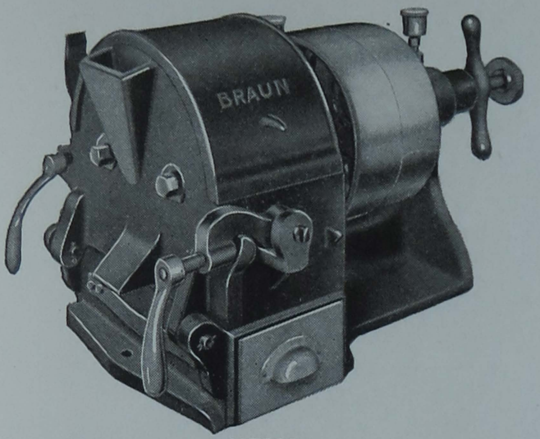
K26
K6
K1
K53

Repair Parts for Model 9½K McCool Pulverizer

Part No.	Description	Each
K 1	Frame	$56.00
K 2	Hinge Pin	2.80
K 3	Front Bearing Pin	.75
K 4	Rear Bearing Pin	.75
K 5	Hopper Lock Adjusting Screw	.80
K 6	Grinding Chamber	21.50
K 7	Lock Pin	.70
K 8	Front Bearing Shell	9.25
K 9	Rear Bearing Shell	8.60
K10	Oil Ring	1.75
K11	Tight Pulley	14.00
K12	Loose Pulley	14.00
***K13**	Eccentric Shaft	23.00
K13a	Rear Bushing	2.50
K13b	Front Bushing	2.50
K14	Disc Shaft	9.00
K15	Stop Spring	.15
K16	Disc Shaft Washer	.50
K17	Disc Driver Key	.25
K18	Key for Tight Pulley	.60
K19	Gear for Eccentric Shaft	11.50
K20	Gear for Disc Shaft	10.25
K21	Key for Eccentric Shaft	.30
K22	Differential Gear	15.50
K23	Gear Hanger	9.75
K24	Gear Hanger Bushing	4.65
K25	Gear Hanger Pin	$1.50
K26	Gear Hanger Spring	.35
K27a	Thrust Bearing Gland	7.25
K28a	Rear Adjusting Screw	1.50
K28b	Rear Adjusting Handle and Screw	4.20
K29	Disc Driver	9.75
K30	Spring for Disc Driver	.55
K31	Cover for Front Bearing	2.25
K32	Cover for Gear Case	4.00
K33	Belt Shifter Support	7.50
K34	Bridge for Belt Shifter	2.40
K39	Belt Shifter Body	3.00
K40	Belt Shifter Handle	2.70
K41	Belt Shifter Pin	1.00
K44	Rotary Disc	5.00
K45	Stationary Disc	5.00
K46	Hopper Lock Handle	2.50
K47	Lock Handle Roller	1.25
K48	Lock Handle Spring	.35
K49	Thrust Button	2.50
K51	Oil Gauge	1.50
K52	Not used.	
K53	Sample Pan	$6.00
K54	Hinge Pin Lock Spring	.40
K56	Not Used.	
K57	Not used.	

*New style eccentric shaft with bushings and oil seals.......... **$35.00**
To use this on old-style machine requires new front bearing shell, K8.

Crushers and Pulverizers, Continued



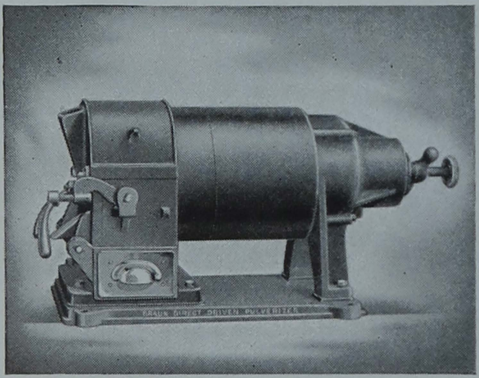
127M1

127M1 Pulverizers, Type UA, Braun. A belt-driven straight-drive machine without gears. Economical and efficient in operation. The machine is fed through a spout in the door and will take material ¼-inch mesh and smaller and reduce it in one grinding to 100 mesh and finer. Permanent adjustment for fineness of grinding can be made and is not altered when the machine is opened for cleaning. The interior of the grinding chamber is smooth finished and all parts are readily accessible for rapid and thorough cleaning.

Plates are of special alloy combining hardness and toughness and can be replaced easily.

Length, 23 inches; width, 14 inches; height, 14½ inches. Speed, 850 R. P. M.; power, 1 H. P. Pulleys, 9x2½ inches. Shipping weight, 275 pounds. Complete with tight and loose pulleys and one set of grinding plates. **Each**........ **$142.00**

127M2 Grinding Plates. For 127M1. **Set**.......... **$8.80**



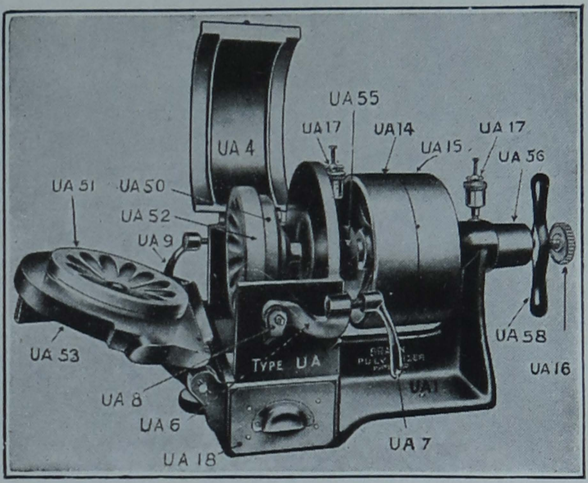
127M3

127M3 Pulverizers, Type UD, Direct Motor Driven, Braun. Similar to 127M1, except with built-in motor which is protected from dust by a dust collector and from overloading by a thermal relay. Ball bearings are used throughout, and the machine is very compact with no belts, pulleys and shafting required.

Length, 33 inches; width, 16 inches; height, 15¼ inches. Shipping weight, 450 pounds. Complete with grinding plates, 2-H. P., 3-phase, 60-cycle, 220-volt A. C. motor and thermal switch. **Each**... .... **$305.00**

127M4 Pulverizers, Type UD, Direct Motor Driven, Braun. Same as 127M3, except for 440 volts. **Each**. **$305.00**

127M5 Grinding Plates. For 127M3 and 127M4. **Set**.. **$8.80**

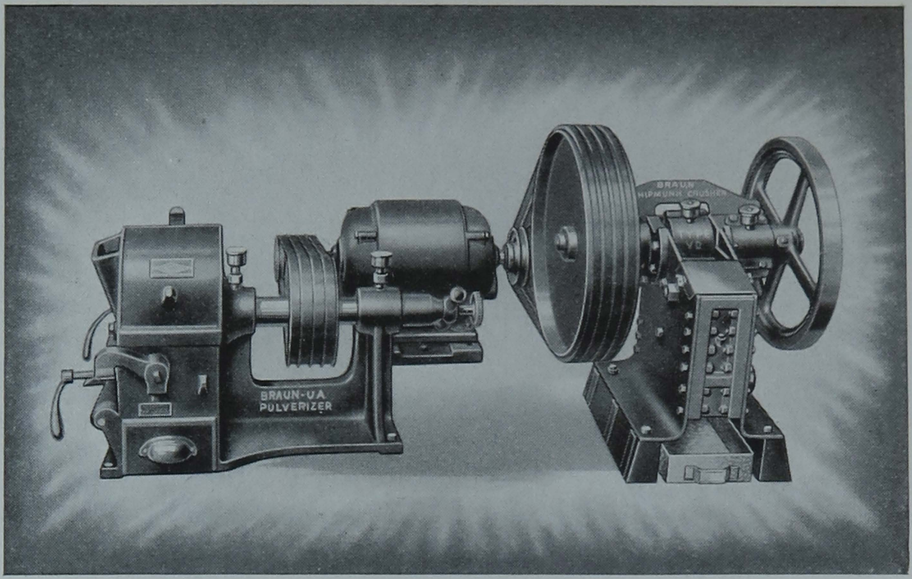


127M6 Repair Parts For 127M1 and 127M3

Part No.	Description	Price Each
UA 1	Frame	**$60.50**
UA 3	Hinge Pin for door	**.17**
***UA 4**	Cover	**5.50**
UA 5	Hinge Pin for cover	**.17**
UA 6	Drop clutch	**1.10**
UA 7	Hand screw for clutch	**.85**
UA 8	Screw for clutch	**.30**
UA 9	Eye bolt with hand nut	**.85**
UA 10	Pin for eye bolt	**.17**
UA 12	Cap screw for stationary plate	**.17**
UA 14	Tight pulley, 9x2½ inches	**5.50**
UA 15	Loose pulley, 9x2½ inches	**5.50**
UA 16	Hand adjusting screw	**.85**
UA 17	Grease cup	**.55**
UA 18	Ore pan	**1.10**
UA 20	Collar with set screws	**.85**
UA 21	Steel washer	**.12**
UA 24	Brush	**.85**
UA 49	Masterpiece	**5.50**
UA 50	Flange with shaft	**7.70**
UA 51	Stationary plate	**4.40**
UA 52	Revolving plate	**4.40**
***UA 53**	Door	**22.00**
UA 54	Cap screws for revolving plate	**.25**
UA 55	Babbitted bushing for front bearing	**5.50**
UA 56	Babbitted bushing for rear bearing	**5.50**
UA 57	Malleable bracket for supporting cover	**1.10**
UA 58	Lock lever	**.85**
UA 59	Set screw for front bearing UA 55	**.50**
UA 60	Set screw for rear bearing UA 56	**.50**
UA 62	Cap screw for bracket UA 57	**.17**
UA 63	Washer for cap screw for stationary plate	**.12**
UA 64	Lag screws	**.07**
UA 65	"S" wrench	**.40**
UA 66	Wrench	**.40**
UA 67	Shock absorbing spring for door	**.65**

*Owing to the need of extreme accuracy in boring the hinge holes for the door and cover, these parts are sent blank to be fitted and bored at destination.

Crushers and Pulverizers, Continued



128M1

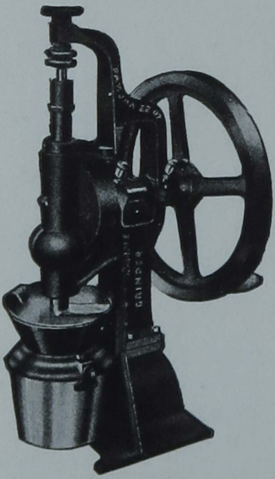
128M1 Crusher and Pulverizer Outfits, Braun. With motor-driven 'V" belt drive. Consists of a 123M3 Type VD crusher and 127M1 pulverizer, mounted upon a common base and driven by a single electric motor. The assembly occupies a minimum amount of space and the close hook-up reduces power losses.

The motor is provided with an extended shaft upon which the motor pulleys are mounted to drive the two machines. All pulleys are grooved for V-belt drive with the exception of the crusher pulley. This 17-inch diameter pulley is large enough to provide more than sufficient frictional contact with the belt for driving without slipping. The belts driving the two machines can be tightened independently. Complete with 2 H. P., 3 phase, 50/60 cycle, 220-volt enclosed motor; starting switch; pulleys; V-belts and bench top. Shipping weight, 800 pounds. **Each**......**$405.00**

128M2 Crusher and Pulverizer Outfits, Braun. Same as 128M1, except for 440 volts. **Each**......**$405.00**

128M3 Crusher and Pulverizer Outfits, Braun. With 123M3 Type WD crusher; 127M1 pulverizer; 3 H. P., 3 phase, 50/60 cycle, 220-volt enclosed motor; starting switch; pulleys; V-belts and bench top. Shipping weight, 1,100 pounds. **Each**..**$505.00**

128M4 Crusher and Pulverizer Outfits, Braun. Same as 128M3, except for 440 volts. **Each**......**$505.00**



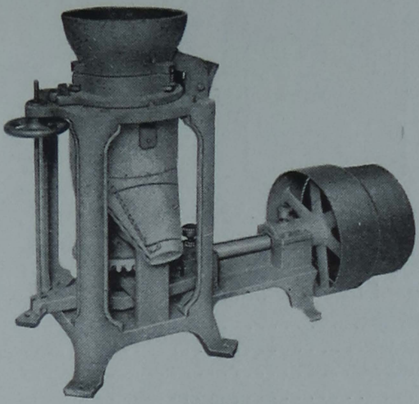
128M5

128M5 Ore Sample Grinders, Braun. A hand-powered laboratory machine capable of pulverizing a 4-ounce sample of hard quartz rock to 100 mesh in 3 minutes.

Permanent adjustment for mesh can be maintained by setting the two lock nuts in the proper position. Only the nut at the top of the adjusting screw is released to lower the revolving plate for thorough cleaning. The machine is dust proof, and there is no loss of material. The gears are machine cut and are enclosed. The vertical shaft runs in oil-less bearings and is supported on ball bearings. Height, 31 inches; width, 21 inches; hand wheel, 16x2 inches; grinding plates, 6 inches; shipping weight, 180 pounds. **Each**......**$95.00**

128M6 Grinding Plates. For 128M5. Set of two, consisting of one revolving and one stationary plate. **Set**......**$8.80**

Crushers and Pulverizers, Continued

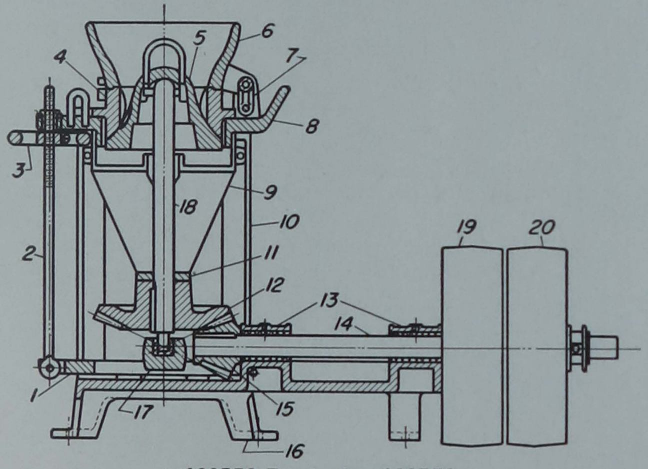


129M1

129M1 Ore Sample Grinders, No. 2. Of heavy construction, and extremely durable. Ore is reduced by a stationary grinding ring and a revolving cone driven by gear and pinion. Belt drive with tight and loose pulley.

Parts are readily accessible for cleaning and the grinding ring and cone are easily replaced. The machine will reduce ½-inch ore to 20 mesh at the rate of 4 pounds per minute.

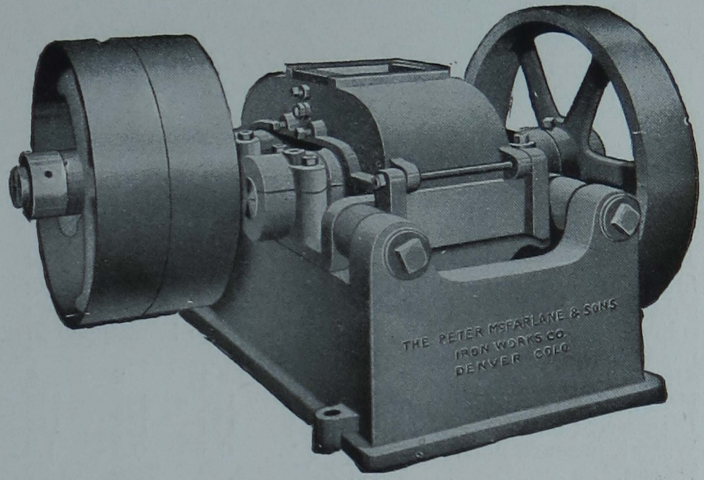
Speed of drive shaft, 150 R. P. M.; pulley size, 18x6 inches; 3 to 5 H. P. required. Shipping weight, 850 pounds.
Each..**$225.00**



129M2 Parts for 129M1

When ordering extra parts, give serial number of machine and all name plate data.

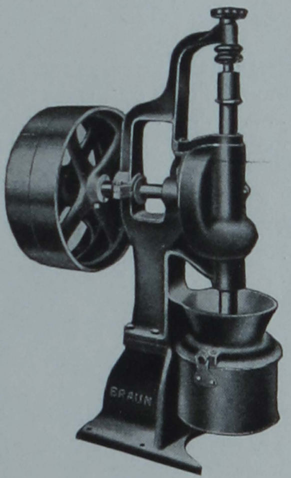
Part No.	Description	Price
1	Yoke. **Each**	$
2	Adjusting Rod. **Each**	$
3	Headwheel. **Each**	$
4	Ring, Manganese Steel. **Each**	$ 9.00
5	Cone, Manganese Steel. **Each**	$ 9.00
6	Hopper. **Each**	$
7	Hopper Hinge. **Each**	$
8	Top Base. **Each**	$
9	Sample Chute. **Each**	$
10	Standards. **Each**	$
11	Thrust Bridge. **Each**	$
12 & 15	Bevel Gear and Pinion. **Set**	$20.00
13	Bearing Caps. **Each**	$
14	Main Drive Shaft. **Each**	$
16	Base. **Each**	$
17	Step Bearing. **Each**	$
18	Vertical Shaft. **Each**	$
19	Tight Pulley. **Each**	$
20	Loose Pulley. **Each**	$



129M3

129M3 Sampling Rolls, Laboratory. Heavy; substantial; with forged steel shells, hard iron adjustable cheek plates and a housing that can be thrown back to clean the rolls.

Size rolls, diameter x face, inches	10x6
Floor space, inches	36x50
Size pulleys, inches	18x3
Speed, R. P. M.	225 to 250
H. P., approximate	4
Weight, shipping	1200
Each	**$275.00**



129M4

129M4 Coal or Coke Sample Grinders, Braun. A belt-driven machine with tight and loose pulleys capable of pulverizing 2 pounds of coal to 20 mesh in 1 minute.

Plates are adjustable for fineness of grinding and are easily replaced.

Height, inches	**31**
Width, inches	21
Size, pulleys, inches	16x2
Number of pulleys	2
Size grinding plates, inches	6
Speed, R. P. M.	200
H. P. required	½
Weight, shipping, pounds	190
Each	**$105.00**

129M5 Coal or Coke Sample Grinders, Braun. Same as 129M4, except for hand power. Shipping weight, 180 pounds.
Each..**$95.00**

129M6 Grinding Plates. For 129M4 and 5. Set of two consisting of one revolving and one stationary plate. **Set**. . **$8.80**

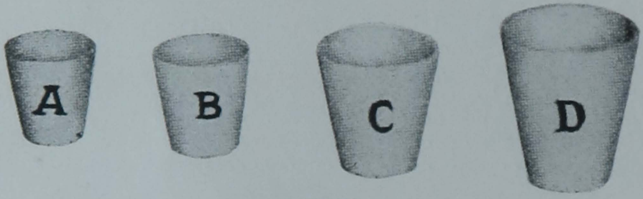
130M1

130M1 Cups, Annealing, Clay. Made of the finest selected fire clay. Surface very white and smooth. Used for annealing gold buttons and ignition of precipitates such as barium sulphate, copper sulfide, silica, etc. Each cup is wrapped in paper and packed in boxes of 12.

Size	**0**	**1**	**2**	**3**
Height, inches	1¼	1⅜	1¾	2⅛
Diameter, top, inches	1⅛	1⅜	1⅝	1¾
Weight, per box, pounds	0.4	0.5	0.8	1.2
Dozen	**$1.50**	**1.50**	**1.50**	**1.50**

130M2 Covers, Only. For annealing cups, 130M1.

Size	0	1	2	3
Dozen	**$ .45**	**.45**	**.45**	**.45**



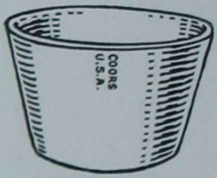
130M3

130M3 Cups, Annealing, Battersea. Imported annealing cup of perfectly smooth finish and correct porosity.

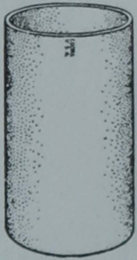
Size	**A**	**B**	**C**	**D**
Height, inches	1⅛	1¼	1½	2
Diameter, top, inches	1⅛	1¼	1½	1¾
Dozen	**$2.75**	**3.00**	**3.25**	**3.50**

130M4 Covers, Only. For annealing cups, 130M3.

Size	A	B	C	D
Dozen	**$ .75**	**.75**	**.75**	**.75**



130M5



130M6

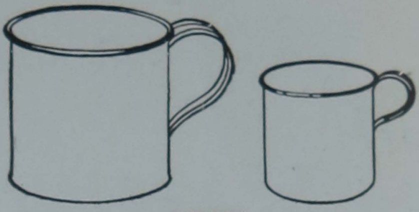
130M5 Cups, Annealing, Coors Porcelain. Conical form. Glazed inside and outside with exception of outside bottom surface.

Size	**0**
Capacity, ml	15
Height, mm	25
Diameter, rim, mm	38
Diameter, bottom, mm	27
Each	**$ .22**

130M6 Cups, Porous, Coors Porcelain. Possesses much greater strength and porosity than standard porous ware.

Size	**1**	**4**	**5A**	**8**
Height, mm	76	90	126	177
Diameter, mm	25	40	50	76
Each	**$ .16**	**.22**	**.33**	**.60**

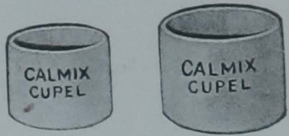
Cup Trays, Annealing. See page 394.



130M7

130M7 Cups, Enamelware. Straight sided; white. Of high quality, as used in sugar laboratories.

Capacity, pints	**1**	**2**
Height, inches	3¾	5
Diameter, inches	3½	3⅞
Each	**$ .45**	**.85**



130M8

130M8 Cupels, Calmix. Machine made. Under the process of manufacture, the material used produces a cupel uniform in density and power of absorption with a firm and glossy surface that will not crack or check.

They embody the following advantages·

Need no initial drying.

Absorb more lead than bone ash.

Greater absorbing power permits the use of smaller cupels.

Greater conductivity makes for quick response to temperature regulation and permits exceptionally close control of cupellation.

Uniform in size, appearance and performance.

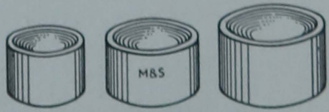
Hard; packed securely; will stand the roughest kind of transportation.

Cupellation losses are much less than with bone ash cupels owing to the better conductivity of the material.

Calmix cupels do not require the careful drying of other cupels. Try this severe test. Place a calmix cupel in a beaker of water. Take it out and without drying, put it in the muffle. The button will cupel perfectly.

Caution: While calmix cupels are harder and will withstand shipment better than bone ash cupels, it will be found that when hot in the muffle, they are softer and therefore require more careful handling than bone ash cupels.

Diameter, inches	**1¼**	**1½**
Absorbtion, lead, grams	30	45
Quantity in carton	100	100
Hundred	**$2.30**	**2.75**



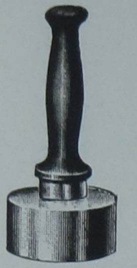
130M9

130M9 Cupels, Bone Ash. Packed in boxes of 100.

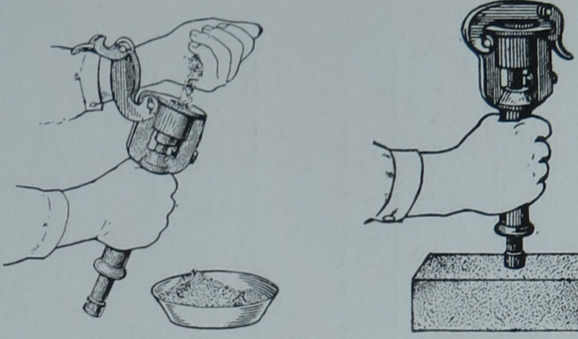
Diameter, inches	**1**	**1⅛**	**1¼**	**1½**	**1¾**	**2**	**2½**
Absorbtion, lead, gm.	10	15	20	30	50	75	150
Hundred	**$1.65**	**2.00**	**2.15**	**2.55**	**3.10**	**3.60**	**4.00**

Cupel Trays, see page 394.

Cupel Molds



131M1



131M3

131M1 Cupel Molds, Hand, Brass. Finely finished. For making cupels.

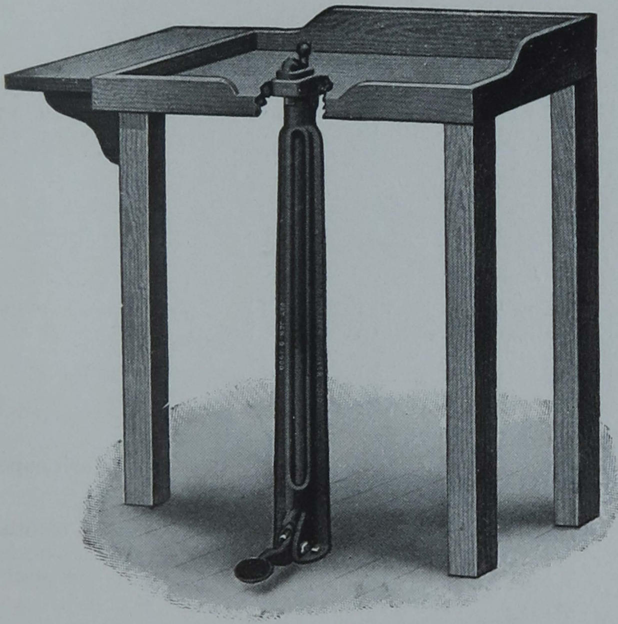
Diameter, inside cup, inches	1	1¼	1½	2	2½
Each	**$3.00**	**3.75**	**4.25**	**6.25**	**10.00**

131M2 Cupel Molds, Hand, Iron. For making cupels.

Diameter, inside cup, inches	1	1¼	1½	2	2½
Each	**$1.80**	**2.25**	**3.00**	**5.00**	**6.50**

131M3 Cupel Molds, Hand, Simplex. Self-contained. No hammer or mallet required. Adjustable for making cupels of greater or less depth.

Diameter, inside cup, inches	1¼	1½
Each	**$8.50**	**8.50**

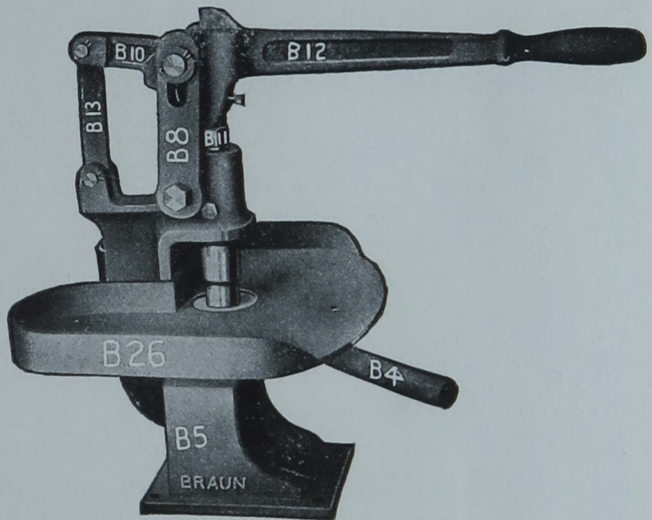


131M4

131M4 Cupel Machines, Iler. Makes cupels of uniform density and size. Operated by foot power, thus leaving both hands free. Dies are quickly and easily changed. For making cupels 1¼ and 1½ inches in diameter. Complete including 1¼ and 1½-inch brass dies and 1¼-inch brass mold. The head of the machine is used as the mold for the 1½-inch die. Without table. **Each** **$36.00**

131M5 Cupel Machines, Iler. Same as 131M4, except larger. For making cupels 1¼, 1½, 1¾ and 2 inches in diameter. Complete including all sizes of brass dies and 1¼, 1½ and 1¾-inch iron molds. The head of the machine is used as the mold for the 2-inch die. Without table. **Each** **$45.00**

131M6 Repair Parts For Machine		**131M4**	**131M5**
Part No.			
A	Main frame	**$22.00**	**$30.00**
B	Pedal	**1.00**	**1.40**
C	Plunger	**4.00**	**5.00**
D	Cover, including bushing bolt and washer	**6.50**	**9.10**
E	Dies, brass. All sizes. **Each**	**3.00**	**4.20**
F	Mold, brass	**3.00**	. . . . .
G	Molds, iron. All sizes. **Each**	. . . . .	**4.20**



131M7

Cupel Machines, Braun.

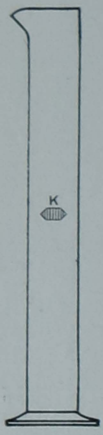
Simple in construction and easily operated. The compressing power in this machine is obtained by a series of levers which multiply the applied power about twenty times. The pressure is steady, and by adjusting, different degrees of compression are obtainable. This overcomes the difficulty found in making cupels of the same absorptive powers of different grades of bone ash, and permits the assayer to make cupels of any density desired. Perfect edges and smooth faces are obtained by expelling cupel downward.

This machine is made with interchangeable molds and dies. Capacity, 200 cupels an hour. The greatest dimensions of the machine are: length, 24 inches; width, 16 inches; height, 19½ inches.

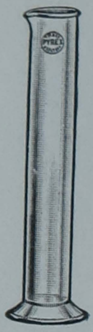
Number	Mold and Die Furnished With Machine Size Inches	Net Weight Pounds	Shipping Weight Pounds	Each
131M7	1¼	48	69	**$47.00**
131M8	1½	48	69	**47.00**
131M9	1¾	48	69	**47.00**
131M10	1¼–1½–1¾	59	90	**62.50**

Note: Order parts by number shown in illustration.

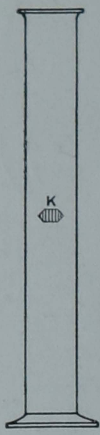
Cylinders



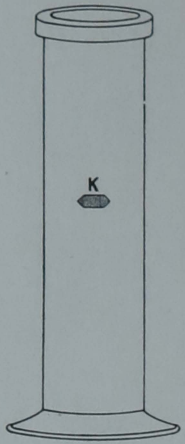
132M1



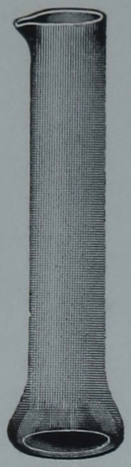
132M2



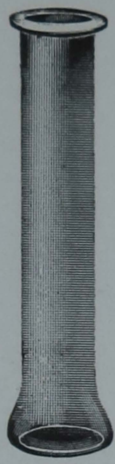
132M3



132M4



132M5



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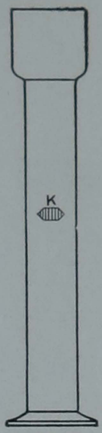

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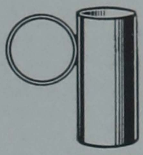

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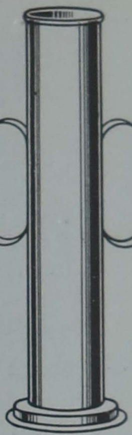


132M9

132M1 Cylinders, Hydrometer. On foot; with pourout.

Diameter, inches	1	1	1½	1½	1½	1½	1½	2	2
Height, inches	5	6	6	8	10	12	15	12	15
Capacity, ml	40	50	125	175	225	275	340	480	600
Quantity in case	72	72	48	48	48	36	36	36	24
Each	**$ .18**	**.20**	**.30**	**.32**	**.36**	**.40**	**.45**	**.50**	**.60**
Case	**$11.66**	**12.96**	**12.96**	**13.81**	**15.55**	**12.96**	**14.58**	**16.20**	**12.96**

132M2 Cylinders, Hydrometer, Pyrex. On foot; with pourout.

Diameter, inches	1	1¼	1½	2⅛	2⅝	3½
Height, inches	6	10	12	14	18	20
Capacity, ml	50	120	240	1040	1170	2220
Quantity in case	36	36	24	24	12	12
Each	**$ .60**	**.75**	**1.00**	**1.20**	**1.50**	**3.00**
Case	**$19.44**	**24.30**	**21.60**	**25.92**	**16.20**	**32.40**

132M3 Cylinders, Hydrometer, Ring Neck. On foot; with glazed flange.

Diameter, inches	1½	1½	1½	1½	2	2
Height, inches	6	8	10	12	12	15
Capacity, ml	125	175	225	275	480	600
Quantity in case	48	48	36	30	24	24
Each	**$ .32**	**.36**	**.40**	**.44**	**.54**	**.64**
Case	**$13.81**	**15.55**	**12.96**	**11.88**	**11.66**	**13.82**

132M4 Cylinders, Hydrometer, Ring Neck. On foot; with ground flange for use with glass plates.

Diameter, inches	3	3	4
Height, inches	12	18	12
Capacity, ml	1050	1700	1950
Quantity in case	18	12	12
Each	**$ .90**	**1.25**	**1.50**
Case	**$14.58**	**13.50**	**16.20**

132M5 Cylinders, Hydrometer, Sugar. With pourout and flared bottom. Capacity, 500 ml. Height, 300 mm. Diameter, 50 mm. **Each** . . . . **$ .80**

132M6 Cylinders, Hydrometer, Sugar, Ring Neck. With glazed flange and flared bottom.

Diameter, inches	1½	2
Height, inches	12	12
Capacity, ml	300	500
Each	**$ .75**	**.85**

132M7 Cylinders, Hydrometer. On foot; with enlarged top.

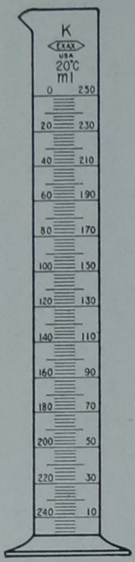
Diameter, inches	1½	2	2
Diameter, top, inches	2⅓	3⅛	3⅛
Height, inches	12	15	16
Capacity, ml	180	400	475
Quantity in case	36	24	18
Each	**$ .56**	**.72**	**.82**
Case	**$18.14**	**15.55**	**13.28**

132M8 Cylinders, Hydrometer, Brass. With handle. For quick measuring. Capacity, 10 ml. **Each** . . . . **$ .25**

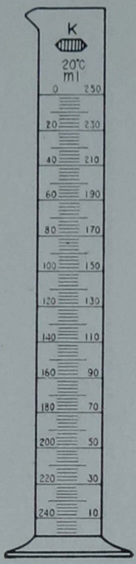
132M9 Cylinders, Hydrometer, Tin. On foot. With handle.

Diameter, inches	2	1½	2
Height, inches	12	15	15
Each	**$1.10**	**1.35**	**1.50**

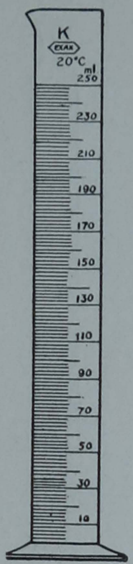
Cylinders, Continued



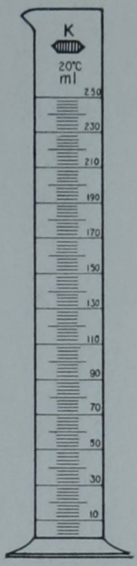
133M1



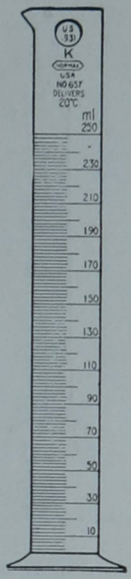
133M2



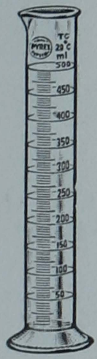
133M3



133M4



133M6



133M7

133M1 Cylinders, Exax Blue Line, Double Graduated. On foot; with pourout.

Capacity, ml.	**5**	**10**	**25**	**50**	**100**	**250**	**500**	**1000**	**2000**
Graduated, ml.	1/10	1/5	1/2	1	1	2	5	10	20
Quantity in case	36	72	72	72	72	36	24	24	12
Each	**$ .55**	**.55**	**.65**	**.70**	**.80**	**1.20**	**1.60**	**2.35**	**3.50**
Dozen	**$ 5.94**	**5.94**	**7.02**	**7.56**	**8.64**	**12.96**	**17.28**	**25.38**	.....
Case	**$15.84**	**31.68**	**37.44**	**40.32**	**46.08**	**34.56**	**30.72**	**45.12**	**33.60**

133M2 Cylinders, Double Graduated. On foot; with pourout.

Capacity, ml.	**5**	**10**	**25**	**50**	**100**	**250**	**500**	**1000**	**2000**
Graduated, ml.	1/10	1/5	1/2	1	1	2	5	10	20
Quantity in case	36	72	72	72	72	36	24	24	12
Each	**$ .30**	**.33**	**.35**	**.40**	**.55**	**.80**	**1.10**	**1.60**	**2.60**
Case	**$ 9.72**	**21.38**	**22.68**	**25.92**	**35.64**	**25.92**	**23.76**	**25.92**	**28.08**

133M3 Cylinders, Exax Blue Line, Single Graduated. On foot; with pourout.

Capacity, ml.	**5**	**10**	**25**	**50**	**100**	**250**	**500**	**1000**	**2000**
Graduated, ml.	1/10	1/5	1/2	1	1	2	5	10	20
Quantity in case	36	72	72	72	72	36	24	24	12
Each	**$ .50**	**.50**	**.60**	**.65**	**.75**	**1.10**	**1.50**	**2.20**	**3.30**
Case	**$14.40**	**28.80**	**34.56**	**37.44**	**43.20**	**31.68**	**28.80**	**42.24**	**31.68**

133M4 Cylinders, Single Graduated. On foot; with pourout.

Capacity, ml.	**5**	**10**	**25**	**50**	**100**	**250**	**500**	**1000**	**2000**
Graduated, ml.	1/10	1/5	1/2	1	1	2	5	10	20
Quantity in case	36	72	72	72	72	36	24	24	12
Each	**$ .25**	**.28**	**.30**	**.35**	**.50**	**.70**	**1.00**	**1.50**	**2.50**
Case	**$ 8.10**	**18.14**	**19.44**	**22.68**	**32.40**	**22.68**	**21.60**	**32.40**	**27.00**

133M5 Cylinders, Normax, Single Graduated. On foot; with pourout. All cylinders are retested and will be found to be accurate within the tolerances specified by the National Bureau of Standards in Circular Number 9, "Testing of Glass Volumetric Apparatus." Calibrated to deliver at 20° C.

Capacity ml.	**10**	**25**	**50**	**100**	**250**	**500**	**1000**
Graduated, ml.	1/10	1/5	1/2	1	2	5	10
Tolerance, ml.	± .05	.10	.15	.30	.70	1.3	2.4
Quantity in case	12	12	12	12	6	6	3
Each	**$ 1.50**	**2.00**	**2.15**	**2.25**	**2.60**	**3.00**	**3.70**
Case	**$14.40**	**19.20**	**20.64**	**21.60**	**12.48**	**14.40**	**8.88**

133M6 Cylinders, Normax, N. B. S., Single Graduated. Same as 133M5, except certified by the National Bureau of Standards.

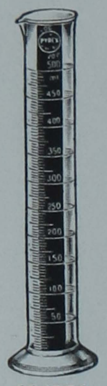
Capacity, ml.	**10**	**25**	**50**	**100**	**250**	**500**	**1000**
Graduated, ml.	1/10	1/5	1/2	1	2	5	10
Tolerance, ml.	± .05	.10	.15	.30	.70	1.3	2.4
Each	**$ 4.50**	**5.00**	**5.15**	**5.25**	**5.60**	**6.00**	**6.70**

133M7 Cylinders, Pyrex, Single Graduated. Ground base; with pourout.

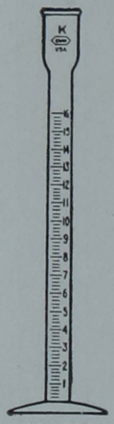
Capacity, ml.	**5**	**10**	**25**	**50**	**100***	**250**	**500**	**1000**	**2000**
Height, inches	4½	5	5¾	6½	10	13	14½	17¾	20⅜
Quantity in case	24	24	24	24	24	12	12	6	6
Each	**$ .85**	**.90**	**1.20**	**1.30**	**1.50**	**2.00**	**2.80**	**3.90**	**5.90**
Case	**$18.36**	**19.44**	**25.92**	**28.08**	**32.40**	**21.60**	**30.24**	**21.06**	**31.86**

***A. S. T. M. D-86 and D-216.**

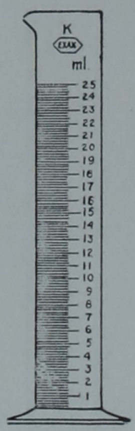
Cylinders, Continued



134M1



134M3



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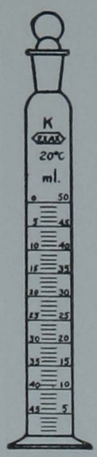

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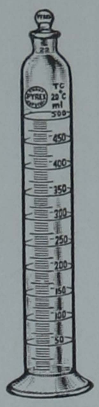
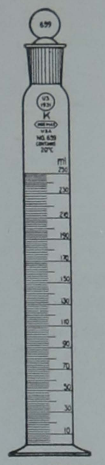


134M6



134M8

134M1 Cylinders, Pyrex, Single Graduated, Lifetime Red. Scale and figures are etched through a red layer into clear glass and no filler is necessary.

Capacity, ml.	**5**	**10**	**25**	**50**	**100**	**250**	**500**	**1000**
Height, inches	4½	5	5¾	6½	10	13	14½	17¾
Quantity in case	24	24	24	24	24	12	12	6
Each	**$ .85**	**.90**	**1.20**	**1.30**	**1.50**	**2.00**	**2.80**	**3.90**
Case	**$18.36**	**19.44**	**25.92**	**28.08**	**32.40**	**21.60**	**30.24**	**21.06**

134M2 Cylinders, Exax Blue Line, Single Graduated. A. S. T. M. D-86 and D-216. Also, in accordance with the requirements of the U. S. Bureau of Mines Technical Paper Number 323-B, graduated to contain 100 ml. in 1 ml. **Each**........**$ .75**
Dozen, $8.10. Case of 72........**$43.20**

134M3 Cylinders, Exax Blue Line, Single Graduated, Brown-Duvel. With enlarged top. Made in accordance with the requirements of the U. S. Bureau of Plant Industry Bulletin Number 56. Capacity, 16%. Graduated in ⅕%. **Each**......**$ .80**
Dozen, $8.64. Case of 72........**$46.08**

134M4 Cylinders, Exax Blue Line, Single Graduated. For use in the Brown-Duvel moisture test. Guaranteed to be accurate within ±.10 ml. Capacity, 25 ml. Graduated in ⅕ ml. **Each, $ .80. Dozen, $8.64. Case** of 72........**$46.08**

134M5 Cylinders, Exax Blue Line, Double Graduated. On foot; with glass stopper.

Capacity, ml.	**10**	**25**	**50**	**100**	**250**	**500**	**1000**	**2000**
Graduated, ml.	⅕	½	1	1	2	5	10	20
Quantity in case	24	36	36	36	24	18	12	6
Each	**$ .80**	**.80**	**.90**	**1.10**	**1.50**	**2.10**	**3.00**	**5.00**
Dozen	**$ 8.64**	**8.64**	**9.72**	**11.88**	**16.20**	**22.68**	.....	.....
Case	**$15.36**	**23.04**	**25.92**	**31.68**	**28.80**	**30.24**	**28.80**	**24.00**

134M6 Cylinders, Pyrex, Single Graduated. On foot; with glass stopper.

Capacity, ml.	**5**	**10**	**25**	**50**	**100**	**250**	**500**	**1000**	**2000**
Height, inches	6	6	7	8	11½	14	16	19¼	22
Quantity in case	24	24	24	18	18	12	6	6	4
Each	**$ 1.15**	**1.20**	**1.50**	**1.80**	**2.10**	**2.80**	**3.60**	**5.00**	**7.50**
Case	**24.84**	**25.92**	**32.40**	**29.16**	**34.02**	**30.24**	**19.44**	**27.00**	**27.00**

134M7 Cylinders, Normax, Single Graduated. On foot; with glass stopper. All cylinders retested to be accurate within the tolerances specified by the National Bureau of Standards in Circular Number 9, "Testing of Glass Volumetric Apparatus." Calibrated to contain at 20° C.

Capacity, ml.	**10**	**25**	**50**	**100**	**250**	**500**	**1000**
Graduated, ml.	⅒	⅕	1	1	2	5	10
Tolerance, ml. ±	.03	.06	.10	.20	.45	.85	1.6
Quantity in case	12	12	12	12	6	6	3
Each	**$ 1.80**	**2.20**	**2.40**	**2.60**	**3.00**	**3.60**	**4.50**
Case	**$17.28**	**21.12**	**23.04**	**24.96**	**14.40**	**17.28**	**10.80**

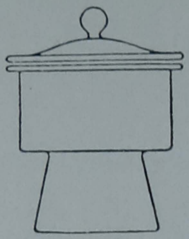
134M8 Cylinders, Normax, N. B. S., Single Graduated, Glass Stoppered. Same as 134M7, except certified by the National Bureau of Standards.

Capacity, ml.	**10**	**25**	**50**	**100**	**250**	**500**	**1000**
Graduated, ml.	⅒	⅕	1	1	2	5	10
Tolerance, ml. ±	.03	.06	.10	.20	.45	.85	1.6
Quantity in case	12	12	12	12	6	6	3
Each	**$ 4.80**	**5.20**	**5.40**	**5.60**	**6.00**	**6.60**	**7.50**

134M9 Cylinders, Single Graduated, Bakelite. Will withstand hydrofluoric acid. Cylinder tube of one-piece construction, cannot leak.

Capacity, ml.	**10**	**25**	**50**	**100**
Graduated, ml.	⅕	½	1	1
Each	**$ 4.00**	**5.00**	**8.00**	**13.50**

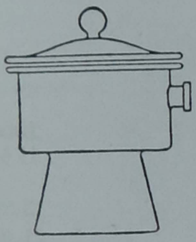
Desiccators



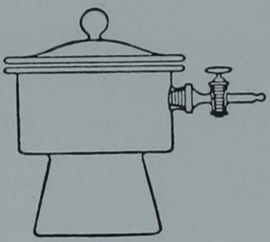
135M1

135M1 Desiccators, Scheibler. With ground glass flange and cover. Without porcelain plate.

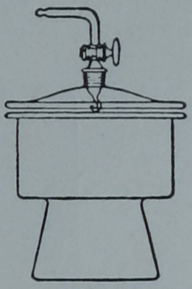
Diameter, inside, inches	**5**	**6**	**8**	**10**
Diameter, inside, mm.	120	150	200	250
Height, inches	6	6	8	9¼
Each	**$2.15**	**3.00**	**6.50**	**8.25**



135M2



135M3



135M4

135M2 Desiccators, Scheibler. With side tubulature. Without porcelain plate.

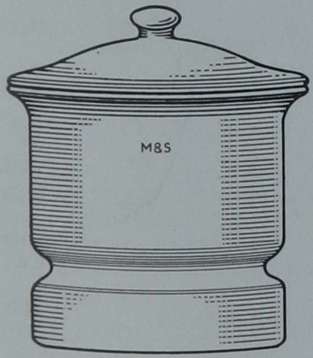
Diameter, inside, inches	**6**	**8**	**10**
Diameter, inside, mm.	150	200	250
Each	**$3.75**	**6.00**	**10.50**

135M3 Desiccators, Scheibler. With stopcock ground into side tubulature. Without porcelain plate.

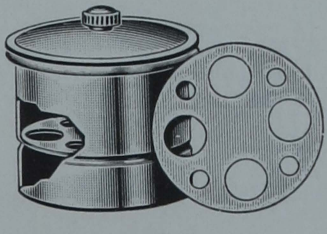
Diameter, inside, inches	**6**	**8**	**10**
Diameter, inside, mm.	150	200	250
Each	**$6.50**	**10.50**	**15.00**

135M4 Desiccators, Scheibler. With tubulature and stopcock ground into cover. Without porcelain plate.

Diameter, inside, inches	**6**	**8**	**10**
Diameter, inside, mm.	150	200	250
Each	**$6.50**	**10.50**	**15.00**



135M5



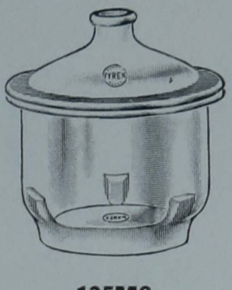
135M6

135M5 Desiccators, Fruehling and Schultz. With ground glass flange and cover. Without porcelain plate.

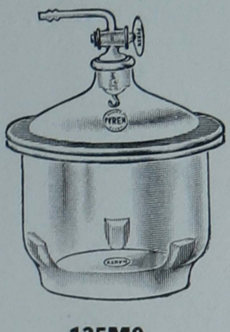
Diameter, inside, inches	**8**	**10**
Diameter, inside, mm.	200	250
Height, inside, inches	11	12
Each	**$5.50**	**9.00**

135M6 Desiccators, Aluminum. Body of heavy one-piece construction with flanged rim. ⅛-inch thick cover, ground to body. Heavy plate with four 1⅛-inch holes. Diameter, 4½ inches; depth, 4 inches; height above plate, 2⅜ inches. Weight, 12 ounces. **Complete** **$3.00**

135M7 Desiccators, Aluminum. Same as 135M6, except diameter, 8¼ inches; depth, 7¾ inches; height above plate, 5 inches. Plate has 9 holes 1⅛ inches and 3 holes 1½ inches. **Complete** **$11.00**



135M8



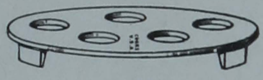
135M9

135M8 Desiccators, Pyrex. Cover with tubulature to fit rubber stopper. Without porcelain plate.

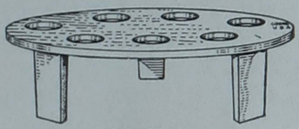
Diameter, inside, inches	8	10
Each	**$11.00**	**13.50**

135M9 Desiccators, Pyrex. Cover with tubulature and stopcock. Without porcelain plate.

Diameter, inches	8	10
Each	**$16.50**	**19.50**



135M0



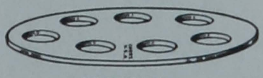
135M11

135M10 Desiccator Plates, Coors Porcelain. On three small feet. Glazed on one side. Height of feet, ⅝ inches.

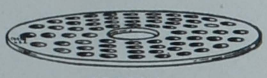
Size	**1**	**2**	**3**	**4**	**5**
Diameter, mm.	95	115	142	190	230
Thickness, mm.	5	5	6	6	6
Number, holes	3	4	5	7	8
Dia. holes, mm.	30	30	30	30	30
Each	**$ .99**	**1.10**	**1.50**	**2.35**	**3.00**

135M11 Desiccator Plates, Coors Porcelain. Same as 135M10, except height of feet 2 inches.

Size	4	5
Each	**$2.60**	**3.25**



135M12



135M14

135M12 Desiccator Plates, Coors Porcelain. Glazed on one side, without feet.

Size	**4**	**5**
Diameter, mm.	190	230
Thickness, mm.	6	6
Number of holes	7	8
Diameter, holes, mm.	30	30
Each	**$2.10**	**2.50**

135M13 Desiccator Plates, Coors Porcelain. Glazed on one side without feet, with numerous perforations and large hole in center.

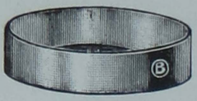
Size	**4**	**5**
Diameter, mm	190	230
Thickness, mm.	6	6
Diameter, holes, mm.	1	2
Each	**$2.10**	**2.50**

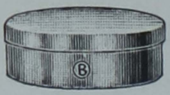
135M14 Desiccator Plates, Coors Porcelain. Glazed on one side without feet, with numerous 5 mm. perforations. Large hole in center.

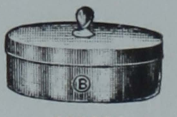
Size	**3**	**4**	**5**
Diameter, mm.	140	190	230
Thickness, mm.	5	6	6
Each	**$1.65**	**2.60**	**3.25**

136M1 Diffusion Shells, Whatman. For use as osmotic membranes and for the dyalysis of small quantities of fluid.

Diameter, mm.	**16**	**35**
Height, mm.	90	100
Box of 25	**$5.95**	**13.85**


136M2

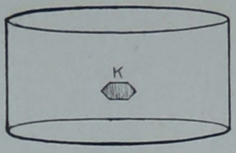

136M3

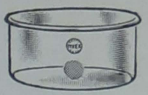

136M4

Dishes, Aluminum. Used for milk or flour analysis. Well adapted to many other uses. Made of sheet aluminum, with straight sides, and of same diameter at both top and bottom. Diameters of dishes and covers are accurately maintained to permit interchangeability. Highly polished outside, cleaned bright inside.

Capacity, ml.	**20**	**50**	**120**	**110**	**135**	**200**
Diameter, mm.	50	65	70	76	89	102
Depth, mm.	12	15	32	25	19	25
Diameter, inches	2	2½	2¾	3	3½	4
Depth, inches	½	⅝	1¼	1	¾	1
136M2 Dishes without covers. Each	**$ .18**	**.22**	**.27**	**.30**	**.36**	**.45**
136M3 Dishes with covers. Each	**$ .36**	**.40**	**.50**	**.55**	**.65**	**.80**

136M4 Dishes, Aluminum. Polished. Cover made with knob. Diameter, 2 inches (50 mm.); depth, 1 inch (25 mm.).
Each .... **$ .55**


136M5

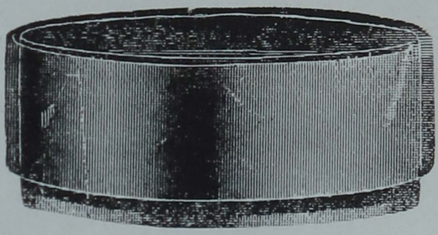

136M6

136M5 Dishes, Crystallizing. With flat bottoms and straight sides.

Diam., mm.	**50**	**60**	**70**	**80**	**100**	**125**	**150**	**190**
Height, mm.	35	35	50	40	50	65	75	95
Quan. in case	72	72	72	72	72	36	30	12
Each	**$ .16**	**.20**	**.22**	**.24**	**.26**	**.45**	**.60**	**.80**
Case	**$10.37**	**12.96**	**14.26**	**15.91**	**17.05**	**14.58**	**16.20**	**8.64**

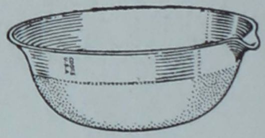
136M6 Dishes, Crystallizing, Pyrex.

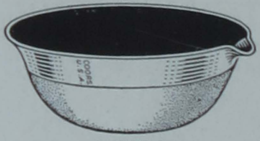
Diam., mm.	**70**	**80**	**90**	**100**	**125**	**150**	**170**	**190**
Height, mm.	50	40	50	50	65	75	90	100
Quan. in case	48	48	48	48	24	24	24	18
Each	**$ .37**	**.40**	**.45**	**.55**	**.85**	**1.15**	**1.25**	**1.50**
Case	**$15.98**	**17.28**	**19.44**	**23.76**	**18.36**	**24.84**	**27.00**	**24.30**

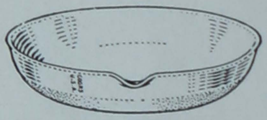

136M7

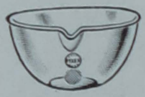
136M7 Dishes, Moist Chambers. Large, with loose fitting covers.

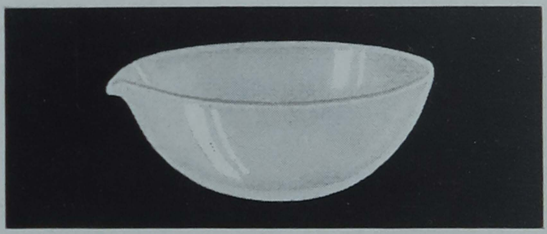
Diameter, outside, cover, mm.	**150**	**200**	**240**
Height, inside, mm.	50	70	80
Each	**$1.25**	**2.40**	**3.50**


136M8


136M9


136M10


136M11


136M12

136M8 Dishes, Evaporating, Coors Porcelain. Sizes to 4A, inclusive, are glazed inside and outside with exception of rim. Larger sizes glazed inside and partly glazed outside.

Size	**0000***	**000**	**00**	**00A**	**0**	**1**	**2**	**3**	**4**	**4A**	**5**	**6**	**6A**	**7**	**8**	**8A**	**9**	**10**
Capacity, ml.	22	35	60	70	80	90	120	150	200	250	300	385	525	765	1285	1400	2100	3250
Diameter, mm.	50	60	70	75	80	85	90	100	110	115	120	145	162	185	215	230	265	305
Height, mm.	21	24	27	30	30	33	37	42	43	45	50	48	51	54	63	70	80	95
Each	**$ .22**	**.14**	**.20**	**.20**	**.22**	**.33**	**.39**	**.44**	**.50**	**.53**	**.60**	**.77**	**.88**	**1.00**	**1.32**	**1.65**	**2.00**	**3.30**

*Suitable for micro analysis.

136M9 Dishes, Evaporating, Coors Porcelain. Black Glaze. Inside surface glazed in hard black glaze for better observation of white precipitates. Dimensions are the same as 136M8.

Size	0000*	000	00	00A	0	1	2	3	4	4A	5	6	6A	7	8	8A	9	10
Each	**$ .40**	**.28**	**.40**	**.40**	**.44**	**.66**	**.78**	**.88**	**1.00**	**1.06**	**1.20**	**1.54**	**1.76**	**2.00**	**2.64**	**3.30**	**4.00**	**6.60**

*Suitable for micro analysis.

136M10 Dishes, Evaporating, Coors Porcelain. Shallow, glazed inside and partly glazed outside. With spout.

Size	**000**	**1**	**2**	**3**	**4**	**5**	**5A**	**6**	**7**
Capacity, ml.	10	35	50	90	160	195	225	325	530
Diameter, mm.	45	70	80	95	105	120	128	140	160
Height, mm.	15	15	20	23	30	34	34	40	48
Each	**$ .18**	**.22**	**.28**	**.45**	**.55**	**.65**	**.72**	**.83**	**1.00**

136M11 Dishes, Evaporating, Pyrex. With lip and flat bottom.

Diameter, mm.	**80**	**90**	**105**	**125**	**150**	**200**
Height, mm.	45	50	55	65	80	100
Quantity in case	72	72	72	36	24	24
Each	**$ .35**	**.40**	**.45**	**.75**	**1.00**	**1.30**
Case	**$22.68**	**25.92**	**29.16**	**24.30**	**21.60**	**28.08**

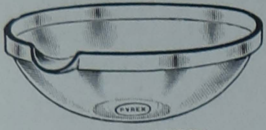
136M12 Dishes, Evaporating, Fused Silica. Opaque glazed. Dimensions given are inside measurements.

Capacity, ml.	**45**	**80**	**100**	**200**	**500**
Diameter, mm.	70	82	98	108	130
Depth, mm.	25	30	30	44	63
Each	**$1.50**	**1.65**	**2.15**	**2.50**	**6.35**

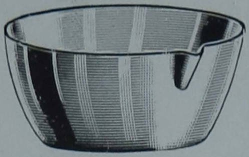
136M13 Dishes, Evaporating, Fused Silica. Transparent. Dimensions given are inside measurements.

Capacity, ml.	**45**	**80**	**100**	**200**
Diameter, mm.	70	82	98	108
Depth, mm.	25	30	30	44
Each	**$4.75**	**6.90**	**7.85**	**11.00**

Dishes, Continued



137M1



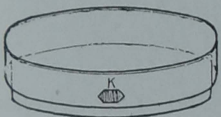
137M2

137M1 Dishes, Evaporating, Pyrex, Large.

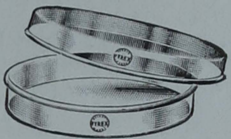
Capacity, liters	**10**	**30**
Diameter, overall, inches	17½	23⅜
Depth, inches	6	8
Quantity in case	6	3
Each	**$ 9.00**	**20.00**
Case	**$48.60**	**54.00**

137M2 Dishes, Evaporating, Nickel. Uniformly shaped, with well formed lips to facilitate pouring, and flat bottoms.

Capacity, ml.	**40**	**100**	**200**	**300**
Diameter, inches	2¼	2¼	3⅜	3⅞
Depth, inches	1⅛	1⅜	1$\frac{13}{16}$	2¼
Diameter, mm	57	70	86	98
Depth, mm	29	35	46	57
Each	**$1.10**	**1.60**	**2.20**	**2.75**



137M3



137M5

137M3 Dishes, Petri. Culture. Fitted in pairs.

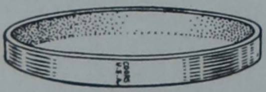
Diameter, mm.	75	100	100
Height, mm.	10	10	15
Quantity in case	72	144	144
Pair	**$ .34**	**.42**	**.42**
Case	**$22.03**	**54.43**	**54.43**

137M4 Dishes, Petri. Culture. Fitted in pairs. Will withstand repeated sterilization at 15 pounds steam pressure. Sizes listed are recommended by the Standardization Committee of the American Bacteriological Society.

Diameter, mm,	100	100
Height, mm.	10	15
Pair	**$ .50**	**.50**
Case of 144	**$64.80**	**64.80**

137M5 Dishes, Petri, Pyrex, Culture. Will withstand repeated sterilization (wet or dry). The edges are beaded. Not affected chemically or thermally by sterilization. The Standardization Committee of the American Bacteriological Society recommends the sizes listed as standard, the 15-mm. height being most widely used.

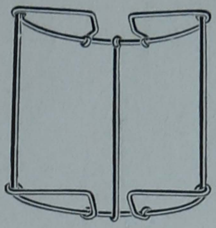
Diameter, mm.	100	100
Height, mm.	10	15
Pair	**$ .38**	**.38**
Case of 72	**$24.62**	**24.62**
137M6 Dish Tops, Only. Each	**$ .19**	**.19**
137M7 Dish Bottoms, Only. Each	**$ .19**	**.19**



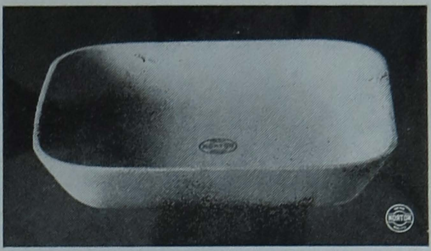
137M8

137M8 Dish Covers, Petri, Coors Porcelain. Porous, glazed outside surface.

Size	**1**	**2**
Diameter, inside, mm.	97	103
Height, mm.	10	10
Each	**$ .28**	**.28**



137M9



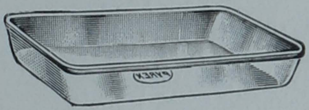
137M10

137M9 Dish Holders, Petri. For retaining Petri dishes in the sterilizer or incubator. Heavy spring brass wire, nickel plated. Accommodates seven dishes 100x10 mm., or five dishes 100-x15 mm. **Each** . . . . . **$ .75**

137M10 Dishes, Incinerating, Alundum. Square. Made of a dense, RA 84, mixture, the porosity of which is 36.9%.

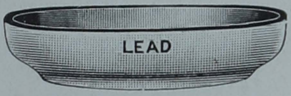
Size	**1**	**2**
Side, inches	2¾	4⅝
Depth, inches	⅝	1
Each	**$ .40**	**1.25**

Note: For alundum ignition capsules and crucibles, see pages 68 and 116.

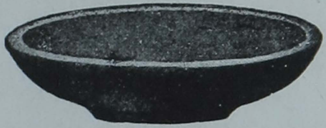


137M11

137M11 Dishes, Drying, Pyrex. Heavy wall drying tray Width at top, inches, 12; length at top, inches, 18; depth inside, inches, 2½. **Each, $5.00. Case** of 5 . . . . . **$22.50**



137M12



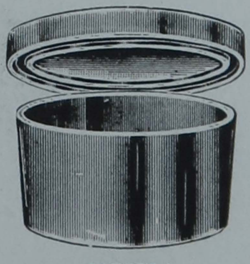
137M13

137M12 Dishes, Lead. For retaining hydrofluoric and sulphuric acids. Usually used in connection with glass etching. Made of pure, heavy sheet lead, with smoothly trimmed edges. Without lip.

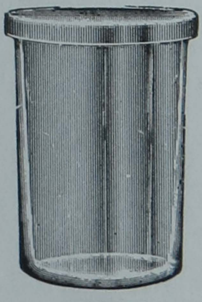
Capacity, ml.	**25**	**75**	**150**	**400**
Diameter, top, inches	2	3	4	6
Depth, inches	⅝	$\frac{13}{16}$	1	1
Each	**$ .10**	**.20**	**.30**	**.60**

137M13 Dishes, Roasting, Clay. For roasting ores in metallurgical tests, assaying, incinerating coal, etc.

Diameter, inches	**4**	**5**	**6**	**8**	**10**
Weight, dozen, net lbs.	3.8	6	12	18	48
Dozen	**$1.50**	**1.75**	**2.60**	**4.00**	**7.50**



137M14

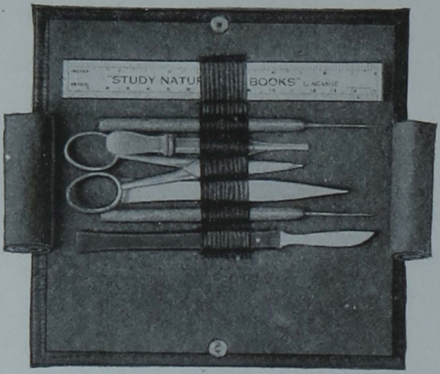


137M17

Dishes, Stender. With ground-on cover. For specimens, paraffin embedding, slides and cover glasses.

Inside dimensions, mm.	Diameter	Height	**Each**
137M14 Dishes	35	18	**$ .18**
137M15 Dishes	50	25	**.20**
137M16 Dishes	60	28	**.30**
137M17 Dishes	60	93	**.36**

Dissecting Apparatus

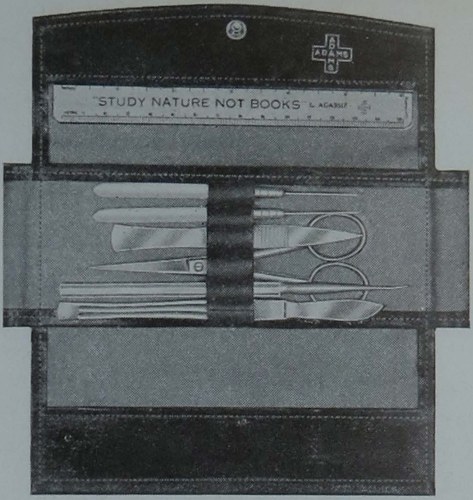


138M1

138M1 Dissecting Sets. In leatherette case with snap button fastener, green felt lining and 7 loops for instruments. Set contains the following instruments:

One 138M12 Scalpel, Dissecting. With Bakelite handle and 1½-inch blade.
Two 138M4 Teasing Needles. Wood handle.
One pair 138M3 Forceps. Sharp point, serrated tip, 4½ inches.
One pair 138M16 Scissors, Dissecting. Sharp points. 4½ inches.
One 138M8 Pipette, Dropping.
One 138M11 Celluloid Rule. 6 inches, (150 mm.).

Set complete.................................... $2.00

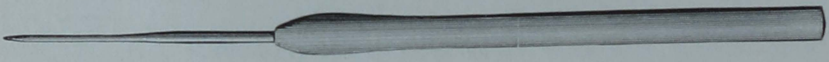


138M2

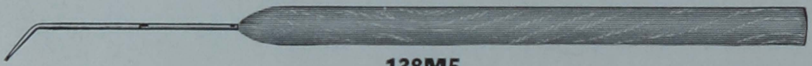
138M2 Dissecting Sets. In leatherette case with snap button fastener, green felt lining. With 6 loops for instruments. Pocket underneath. Set contains the following instruments:

One 138M14 Scalpel, Dissecting. Steel, 1½-inch blade.
One pair 138M15 Scissors, Dissecting. 4½ inches.
One pair 138M3 Forceps, Dissecting. 4½ inches.
Two 138M6 Teasing Needle Holders. Bone handle, with needles.
One 138M9 Probe and Seeker. Angular.
One 138M11 Celluloid Rule. 6 inches, (150 mm.).

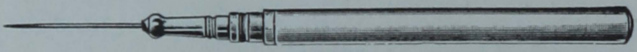
Set complete.................................... $3.25



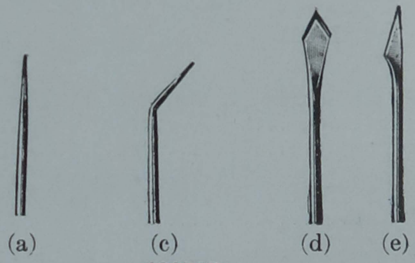
138M4



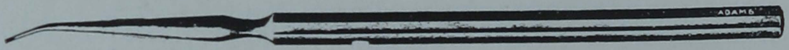
138M5



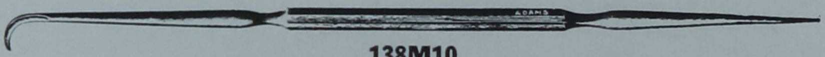
138M6



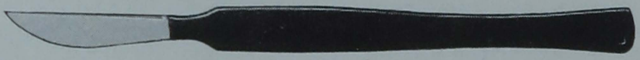
138M7



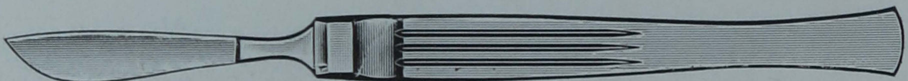
138M9



138M10



138M13



138M14

138M3 Forceps, Dissecting. Sharp point, serrated tip, 4½ inches. **Pair**.................................... $ .25

138M4 Teasing Needles. Wood handle, with straight needle. **Dozen**.................................... $ .30

138M5 Teasing Needles. Wood handle, with angular point. **Dozen**.................................... $ .40

138M6 Teasing Needle Holders. Bone handle, 3¾ inches with straight needle. **Each**.................................... $ .20

138M7 Needles. Length, 2¼ inches. Made in 4 shapes.

Style...	Straight (a)	Angular (c)	Spear Point (d)	Half Spear Point (e)
Dozen..	$ .15	.30	3.75	3.75

138M8 Pipette, Dropping. 3¼ inches. **Each**....... $ .05

138M9 Probe and Seeker. 6 inches, solid steel, angular, semi-blunt tip, 6 mm. diameter handle. **Each**........ $ .30

138M10 Probe and Seeker. Double end, 6 inches, solid steel, sharp point, curved end with sharp inner edge. **Each**.. $ .40

138M11 Celluloid Rule. 6 inches, (150 mm.). **Each**.. $ .10

138M12 Scalpel, Dissecting. Bakelite handle, with 1½-inch blade. **Each**.................................... $ .40

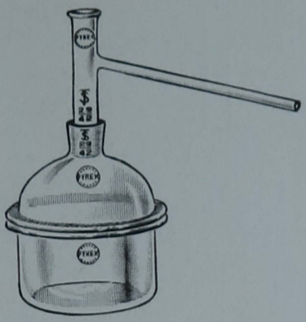
138M13 Scalpel, Dissecting. All steel, overall length, 6$\frac{1}{16}$ inches. Length of blade, 1$\frac{9}{16}$ inches. **Each**.......... $ .30

138M14 Soalpel, Dissecting. All steel, 1½-inch blade. **Each**.................................... $ .75

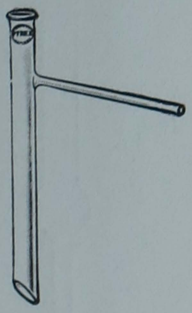
138M15 Scissors, Dissecting. Fine, sharp points. 4½ inches. **Each**.................................... $ .80

138M16 Scissors, Dissecting. Sharp points. 4½ inches. **Each**.................................... $ .55

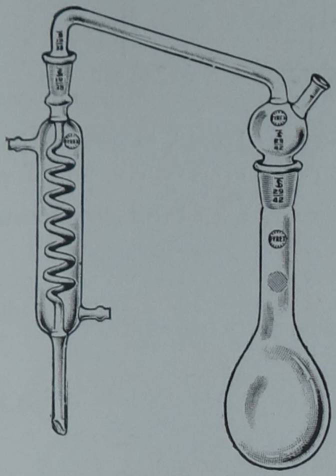
Distilling Apparatus



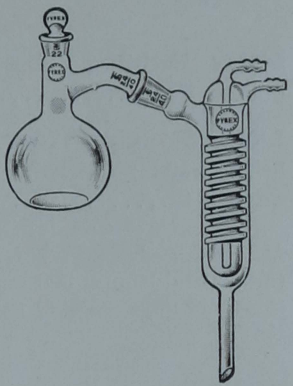
139M5



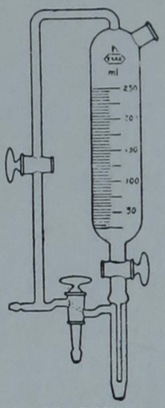
139M9



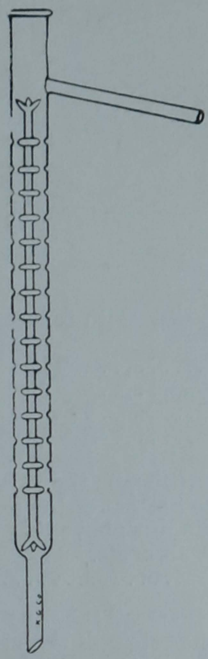
139M1



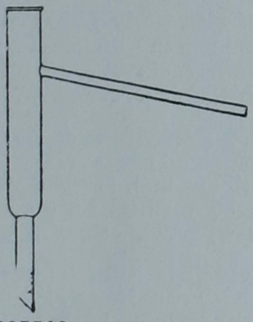
139M6



139M7



139M8



139M10

139M1 Distilling Apparatus, Pyrex, Ammonia. For determination of ammonia in water. Complete with ₮ $^{29}/_{42}$ joint on flask and ₮ $^{19}/_{38}$ joint on the condenser. Capacity, 500 ml. **Each, $7.75. Case** of 4 . . . . **$27.90**

139M2 Condensers, Only. For 139M1. **Each, $3.90. Case** of 6 . . . . **$21.06**

139M3 Flasks, Only. For 139M1. **Each, $1.60. Case** of 8 . . . . **$11.52**

139M4 Connecting Tubes, Only. For 139M1. **Each, $2.25. Case** of 8 . . . . **$16.20**

139M5 Distilling Apparatus, Pyrex, Vacuum. Distilling tube with ₮ $^{29}/_{42}$ ground joint.

Diameter, inside, mm.	**165**
Quantity in case	4
Each	**$ 9.50**
Case	**$34.20**

139M6 Distilling Apparatus, Pyrex, Friedrichs. With spiral condenser and ₮ $^{24}/_{40}$ ground joints.

Capacity, ml.	**500**	**1000**	**2000**
Quantity in case	3	3	3
Each	**$10.65**	**11.90**	**14.35**
Case	**$28.76**	**32.13**	**38.75**

139M7 Distilling Receivers, Exax Blue Line, Bogert. For fractional distillations under diminished pressure. Graduated from 0 to 250 ml. in 5 ml.

Capacity, ml.	**250**
Graduated, ml.	5
Quantity in case	4
Each	**$ 7.00**
Case	**$22.40**

139M8 Distilling Columns, Young. Fractionating; distillation tube with rod and discs. For distillation of small quantities.

Number of discs	**15**	**20**
Height, overall, mm.	642	782
Quantity in case	6	6
Each	**$4.50**	**5.00**
Case	**$24.30**	**27.00**

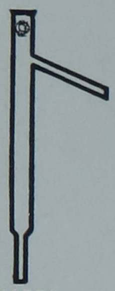
139M9 Distilling Tubes, Pyrex. Straight; with tubulature.

Length, total, mm.	**300**
Quantity in case	12
Each	**$ .75**
Case	**$8.10**

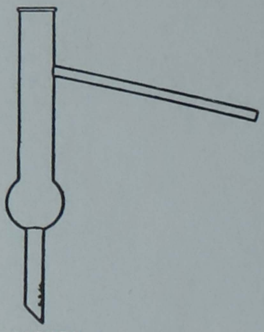
139M10 Distilling Tubes. Straight; with small tube 9¾ to 10½ mm. outside diameter sealed to the bottom of the main tube. The end of this small tube is ground at an angle.

Quantity in case	36
Each	**$ .50**
Case	**$16.20**

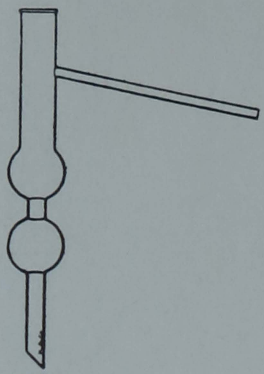
Distilling Tubes, Continued



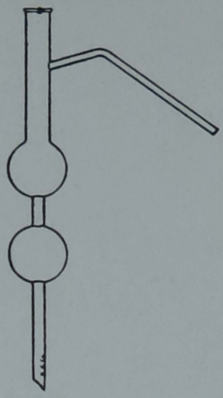
140M1



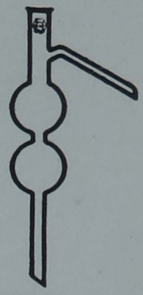
140M2



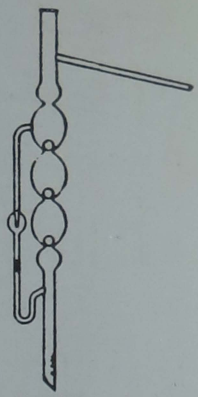
140M3



140M5



140M6



140M7

140M1 Distilling Tubes, Pyrex. With reduced bottom and tubulature.

Length, Body Tube, mm.	**115**	**135**	**225**
Quantity in case	24	24	24
Each	**$ .70**	**.80**	**.90**
Case	**$15.12**	**17.28**	**19.44**

140M2 Distilling Tubes. With small tube 12¾ to 13½ mm. outside diameter sealed to the bottom of the main tube, and with one bulb in the main tube just above this seal. The end of the small tube is ground at an angle.
Each, $ .50. Case of 36 .... **$16.20**

140M3 Distilling Tubes. With small tube 12¾ to 13½ mm. outside diameter sealed to the bottom of the main tube, and with two bulbs in the main tube just above this seal. The end of the small tube is ground at an angle.
Each, $ .60. Case of 24 .... **$12.96**

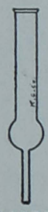
140M4 Distilling Tubes. Same as 140M3, except for three bulbs. **Each** .... **$ .70**

140M5 Distilling Tubes, Wurtz. With two bulbs. Overall height, 330 mm. **Each** .... **$ .70**
Case of 12 .... **$7.56**

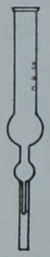
140M6 Distilling Tubes, Pyrex. With two bulbs and tubulature. Total length, 300 mm.
Each, $1.50. Case of 12 .... **$16.20**

140M7 Distilling Tubes, Fractionating, Glinsky. With three large bulbs having glass valves, and with side tube connecting bottom stem with top bulb to equalize pressure. Overall height, 460 mm. **Each, $4.00. Case** of 6 .... **21.60**

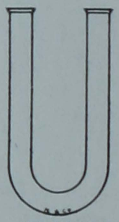
Drying Tubes



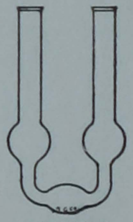
140M8



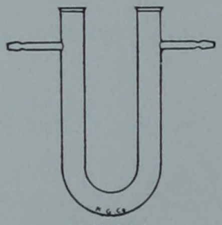
140M9



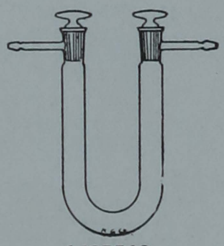
140M10



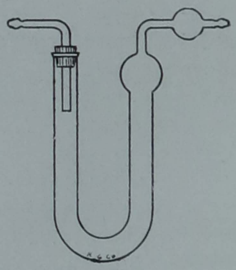
140M11



140M12



140M13



140M14

140M8 Drying Tubes, Calcium Chloride. Straight; with one bulb and reduced bottom.

Length to bottom of bulb, mm.	**100**	**150**	**200**
Quantity in case	144	144	72
Each	**$ .12**	**.14**	**.18**
Case	**$15.55**	**18.14**	**11.66**

140M9 Drying Tubes, Calcium Chloride. Straight; with two bulbs.

Length to bottom of first bulb, mm.	**100**	**150**	**200**
Quantity in case	144	144	72
Each	**$ .20**	**.20**	**.25**
Case	**$25.92**	**25.92**	**16.20**

140M10 Drying Tubes, Calcium Chloride. Plain; "U" shape.

Length, arm tops to center of bend, mm.	**100**	**150**	**200**
Diameter, mm.	16	18	20
Quantity in case	144	144	72
Each	**$ .13**	**.18**	**.24**
Case	**$16.85**	**23.33**	**15.55**

140M11 Drying Tubes, Calcium Chloride, Peligot. With bulb in each arm and also in connecting piece.

Length, mm.	**100**	**150**
Quantity in case	48	48
Each	**$ .44**	**.50**
Case	**$19.01**	**21.60**

140M12 Drying Tubes, Calcium Chloride. Plain; "U" shape. With side arms.

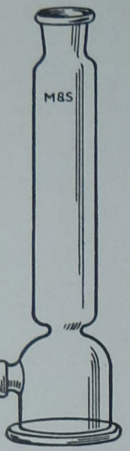
Length, mm.	**100**	**150**	**200**
Diameter, mm.	16	18	20
Quantity in case	72	72	48
Each	**$ .30**	**.35**	**.40**
Case	**$19.44**	**22.68**	**17.28**

140M13 Drying Tubes, Calcium Chloride, Schwartz. with side arms and ground glass stoppers perforated.

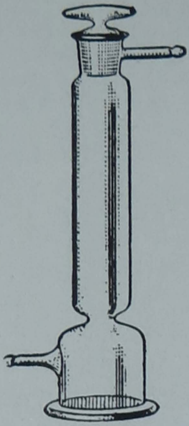
Length, mm.	**100**	**150**
Quantity in case	12	12
Each	**$ 1.50**	**1.60**
Case.	**$16.20**	**17.28**

140M14 Drying Tubes, Calcium Chloride. Marchand. With cork and connecting tube. Height from plain arm top to center of bend, 150 mm. **Each, $ .70. Case** of 36 ... **$22.68**

Drying Towers



141M1



141M2

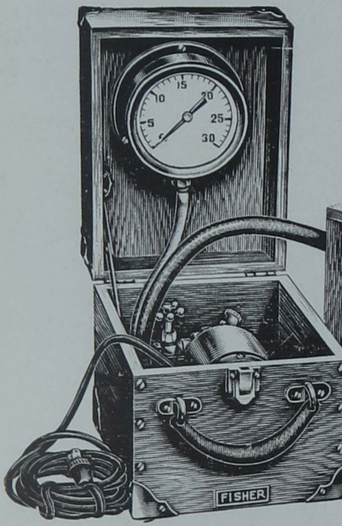
141M1 Drying Towers. For solid absorbents. (250 mm. size is part C of combustion train, see page 103.) Made of heavy glass with wide base and with constriction for supporting absorbents or scrubbing materials in the upper compartment. The top is finished to take a rubber stopper and the lower compartment fitted with side neck for the same purpose.

Height, total, mm.	250	300
Each	**$1.00**	**1.10**

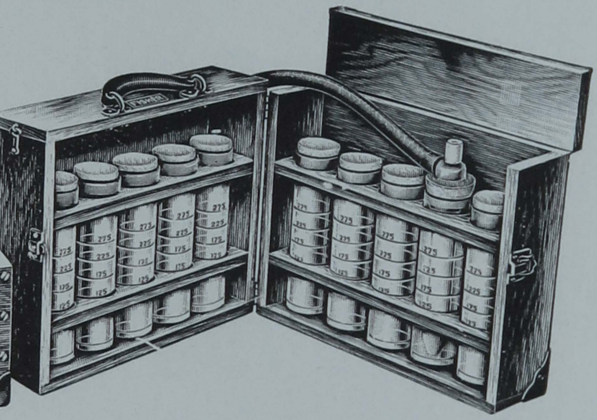
141M2 Drying Towers. Similar to 141M1. For solid absorbents, glass stoppered. With inlet and outlet tubulatures for rubber tubing connection and top closed by a ground glass stopper acting as stopcock.

Height, total, mm.	250	300
Each	**$2.75**	**3.25**

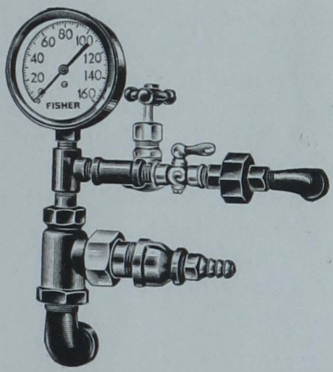
Dust Samplers



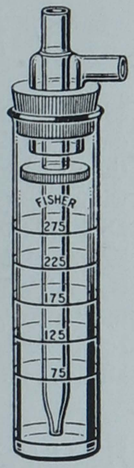
141M3



141M5



141M4



141M6, 141M7, 141M8

141M3 Dust Samplers, Atmospheric. Electrically driven. Modified U. S. Public Health Service Model. Designed after the Hatch-Drinker modification of the Greenburg-Smith Impinger Apparatus. See Public Health Reports, U. S. Public Health Service, Volume XLVII, Number 12, March 18, 1932; also The journal of Industrial Hygiene, Volume XIV, Number 8, October, 1932.

Apparatus should be used with Number 141M5 dust sampling case. These two together form a complete electrically driven dust sampling outfit. Sampler consists of a small lightweight motor-vacuum unit which has a free air capacity somewhat in excess of 1 cubic foot per minute, suitable for 110 volts, 60 cycle, A. C. or D. C.; cord, plug and switch for the motor; calibrated vacuum gauge and bleeder valve for adjusting vacuum to desired degree and a finished hardwood carrying case. Weight, approximately 16 pounds. **Each,** Without Dust Sampling Case. **$65.00**

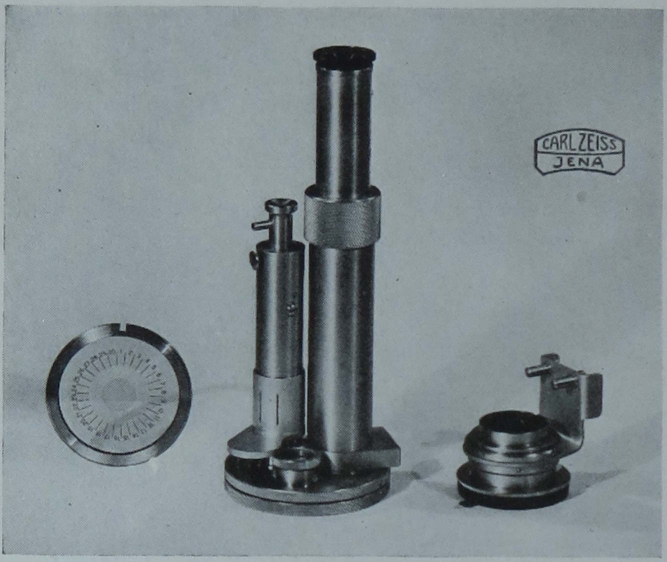
141M4 Dust Samplers, Compressed, Air-driven. Sampler is built to connect to a source of compressed air which is used to draw the sample by passing it through an ejector. A special orifice disc in the apparatus is so constructed that the standard rate of 1 cubic foot per minute of air is sampled when compressed air varying in pressure between 30 and 75 pounds per square inch is passed into the sampler. A gauge and bleeder valve enables the operator to adjust the air pressure to within these limits. Consists of a ¼-inch I. P. connection for the compressed air line, a valve for turning on or off the compressed air, a bleeder valve for pressure regulation, a gauge, ejector, orifice plate and rubber tubing connection for the sampling line. **Each** **$25.00**

141M5 Dust Sampling Cases. Contains the equipment used with either Number 141M3 or Number 141M4 dust samplers to complete dust sampling assembly. Hardwood carrying case contains ten graduated collecting tubes, one Pyrex glass impinger with standard 2.3 mm. orifice, nine solid dust-free stoppers, one dust-free stopper for impinger, one rubber baffle disc and 25 feet of special rubber tubing. **Each** **$45.00**

141M6 Dust Collecting Tubes, Only. Made of glass. Graduated at 5 mm., 75 ml., 125 ml., 175 ml., 225 ml. and 325 ml. **Each** . . **$1.50**

141M7 Dust Impinger Tubes, Only. Improved form. Made entirely of Pyrex glass. With accurately formed 2.3 mm. orifice. **Each** **$3.00**

141M8 Dust Free Stoppers, Rubber, Solid. Used to cap the collecting tubes. **Each** . . . . **$ .15**



142M1

142M1 Dust Konimeters. For taking dust samples from the air without the use of accessory equipment. Regularly used for testing the air in workshops, mills, mines, streets, etc. Consists of a microscope of 200 magnification combined with an air pump of 5 ml. capacity through which the sample is taken and automatically deposited on a sample disc. By turning this disc, each of the 30 fields can be brought under observation.

Complete with squared micrometer 1 mm., one coarse and one fine dust filter and sample disc of 30 fields. **Each**......**$214.00**

Accessories

142M2 Sample Discs. With 30 fields. **Each**..........**$ 9.00**

142M3 Sample Discs. With 10 fields. **Each**..........**$ 2.00**

142M4 Darkfield Condensers. (Recommended for light dust particles.) **Each**..........................**$36.00**

142M5 Squared Micrometers, 1.0 mm. **Each**........**$ 6.00**

142M6 Squared Micrometers, 0.5 mm. **Each**........**$ 9.00**

142M7 Squared Micrometers, 0.2 mm. **Each**........**$12.00**

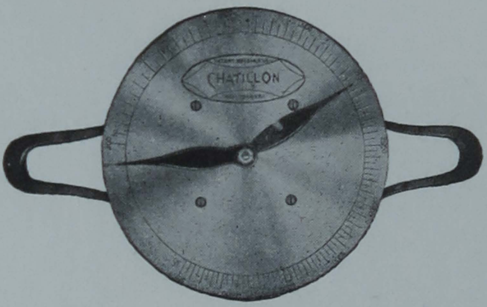
142M8 Squared Micrometers, 0.1 mm. **Each**........**$15.00**

142M9 Squared Micrometers, 1.0 mm., with sector. **Each**..**$15.00**

142M10 Dust Filters. Coarse. Each................**$ 1.75**

142M11 Dust Filters. Fine. Each..................**$ 1.75**

142M12 Dynamometers, Traction Type. Built for determination of breaking strains, tensions, and traction; and may be used in any position, separately or with other apparatus. Recoil device prevents injury. Dial is brass, individually calibrated with deeply cut figures and marks. One of the two pointers indicates the pull at all times, and the other will remain at the maximum point of strain. Metal carrying cases, equipped with padlock and clamp, are available for all sizes, but are not included.



142M12

Size	**1**	**2**	**3**	**4**	**5**
Capacity, pounds	100 to 1000	150 to 2000	150 to 3000	250 to 5000	300 to 7500
Graduations, pounds	10	25	25	50	100
Diam. dial, inches	7	7	8	8	10
Weight, pounds, net	4	4½	5	6½	9
Each	**$120.00**	**140.00**	**160.00**	**180.00**	**210.00**

Size, continued	**6**	**7**	**8**	**9**
Capacity, pounds	500 to 10000	500 to 15000	600 to 25000	1000 to 50000
Graduations, pounds	100	100	200	250
Diam., dial, inches	10	12	14	16
Weight, pounds, net	10½	12½	28	36
Each	**$250.00**	**325.00**	**375.00**	**500.00**

142M13 Ebulliometers, Twin, Tag. For quickly and accurately determining the alcoholic content of beverages and liquids. Officially approved for use under Treasury Decision 4692. Built with two retorts on one stand and heated by one alcohol lamp so that the sample and the water may be boiled simultaneously. The thermometer on the sample chamber is provided with a sliding scale that is graduated in alcoholic percentage. Complete with thermometers, measuring glass, alcohol lamp, carrying case, and instructions. Regularly furnished with 10 percent alcohol scale. Apparatus with 25 per cent alcohol scale on request. **Each**..................................**$70.00**

142M14 Ebulliometers. Same as 142M13, except with gas burner instead of alcohol lamp. **Each**...**$65.50**

142M15 Thermometers. For 142M13. Range 90 to 101° C.; graduated in 20ths; Length, 16-inch. Etched stem type with ferrule, but without scale. **Each**......................**$ 6.50**

142M16 Thermometers. Same as 142M15, except with sliding scale showing up to 10 per cent of alcohol by volume. **Each**...**$10.50**

142M17 Scales, Only. Range 10 per cent of alcohol by volume. Without support. **Each**...**$ 2.50**

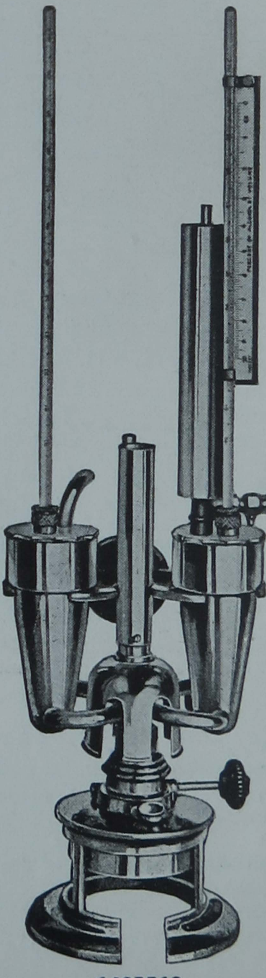
142M18 Bunsen Burners. With flame spreader for gas heating. **Each**................**$ 1.50**

142M19 Alcohol Lamps. Each..**$ 6.00**

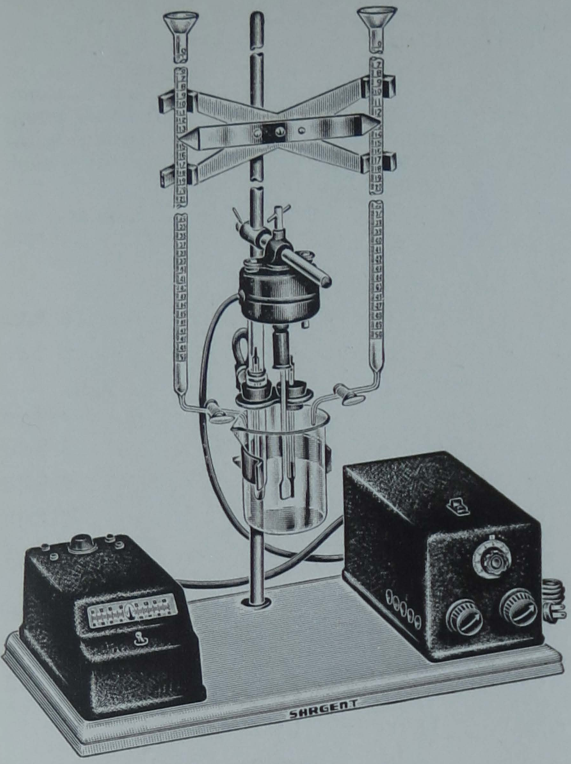
142M20 Condensers. Each..**$ 3.00**

142M21 Chimneys. Each..**$ 1.80**

142M22 Measuring Glasses, 50 ml. **Each**...............................**$ .50**



142M13



143M1

143M1 Electrometric Titration Assembly, Sargent. Continuous Indicating, Willard-Hager Circuit. High Speed, high precision unit operated entirely from standard electric currents, drawing an entirely negligible, minute current quantity from the electrode system and supplying a continuous indication of potential without necessity of balancing operations in the course of titration.

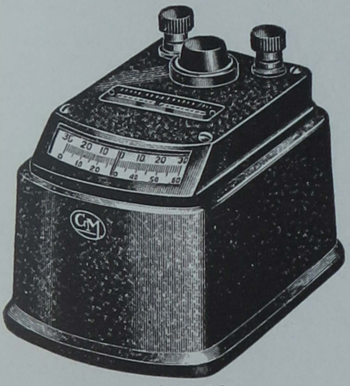
The circuit is a Wheatstone bridge of which two of the arm resistances are the grid to plate resistance of a double element vacuum tube. The twin element tube eliminates errors due to changing tube characteristics. The electrodes are connected between the two grids and protected by high resistance.

Potential indication is shown by a rugged, high precision, enclosed lamp and scale galvanometer with a traveling light spot moving in strictly linear relation with the degree of unbalance in the two bridge arms which is in linear relation with the voltage difference between the two grids. The circuit is equipped with coarse and fine balancing adjustments, a switch for shorting the grids to establish a true zero potential reading and a sensitivity adjustment whereby the total course of inflection during any titration may be adjusted to the scale length. Any electrode system except glass can be employed and the scale may be calibrated for absolute voltage measurement.

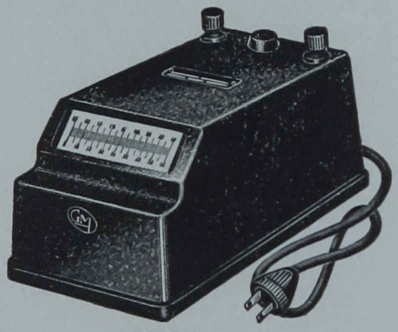
The assembly includes a porcelain enameled base, stirring motor, quick acting beaker platform, compact electrode holder and paired burettes. It requires only a single cord and plug attachment to standard outlets.

Complete as illustrated including one platinum and one calomel electrode, beaker, beaker support, burette and burette clamp for operation on 110-volt, 60-cycle single phase circuits. (Supplied for other power characteristics to order.) **Each**.......................................**$125.00**

Electrical Meters



143M2



143M3

143M2 Galvanometers D'Arsonval, Pointer Type. Completely enclosed in a substantial mounting case. Overall dimensions 4⅜ inches x 6 inches x 4¹¹⁄₁₆ inches high.

The design of the magnetic circuit provides uniform flux density for an angular deflection of nearly 40°, which results in a scale length of 60 mm. The scale is set at an angle of 45° from vertical.

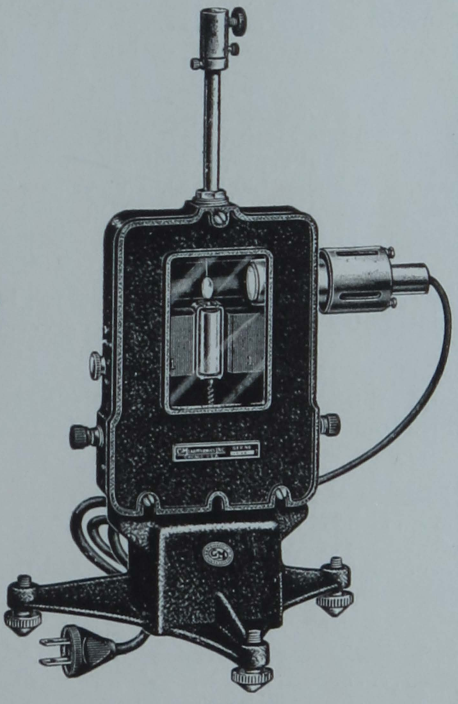
Size	**1**	**2**	**3**	**4**
Sensitivity/mm. div. approx.*	0.10	0.15	0.30	1.00
Coil res. ohms, approx.	1100	300	90	22
Ext. critical damping, res. ohms	8000	1800	700	35
Period, seconds	4	4	4	4
Each	**$21.00**	**20.00**	**20.00**	**19.00**

143M3 Galvanometers D'Arsonval, Mirror Type. With 6-volt lamp and lens system which projects a very sharp, black index line in an illuminated field on the translucent scale, length, 80 mm., set at an angle of 45° from the vertical. Equipped with an enclosed transformer with line cord and plug for operation on 110-120-volt, 50-60-cycle, A. C. which supplies the 6-volt source required for the lamp. Dimensions overall, 10 inches x 5⅜ inches x 5 inches high.

Size	**1**	**2**	**3**	**4**
Sensitivity/mm. div., approx.*	0.02	0.03	0.06	0.20
Coil res., ohms, approx.	1100	300	90	22
Ext. critical damping, res. ohms	12000	2200	1000	70
Period, seconds	4	4	4	4
Each	**$46.00**	**45.00**	**45.00**	**44.00**

*Micro-amperes.

143M4 Galvanometers D'Arsonval, Suspended Coil. High sensitivity for use in scientific and industrial research and student laboratories. All-metal case construction permits electrostatic shielding of all of the coil circuit except the suspension tube and the binding posts, which can be shielded if necessary. The suspension tube is insulated from the case, thus permitting a ground connection to case which is independent of coil circuit. Removable front cover is provided with a broad felt, dust-proof gasket. Glass window, optically clear, makes it possible to read large angles of deflection, or to set the telescope at a wide angle with respect to the mirror. Case dimensions are 5½ inches x 1¾ inches x 8 inches high. Complete with light source which produces a fine index line on scale, and leveling base with enclosed 6-volt transformer.



143M4

Size	**1**	**2**	**3**	**4**
Sensitivity current, micro-amp.*	0.0006	0.003	0.0025	0.0004
Sensitivity voltage, micro-volts†		1.35		
Period, seconds	13	13	6	15
Res. galv., ohms	1500	100	1500	2000
Ext. critical damping res., ohms‡	12000	350	10000	20000
Each	**$48.76**	**48.76**	**48.76**	**52.51**

*Per millimeter deflection at a scale distance of one meter.
†With critical damping resistance in series.
‡ Without damping loop.

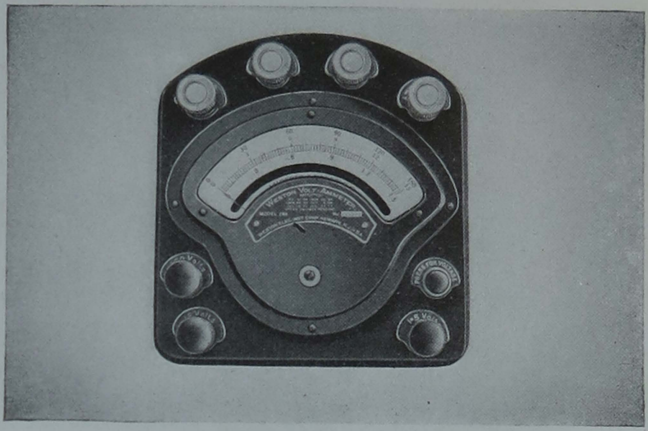
143M5 Leveling Bases. With 3 leveling screws; 9¾ inches x8¾ inches x 4 inches high. Also with enclosed 6-volt transformer with 12-inch 6-volt cord and 10-foot cord and plug for connecting to 110-120-volt 50-60-cycle lighting outlet. **Each**.......................................**$10.13**

Electrical Meters, Continued

144M1

WESTON GALVANOMETER

144M2



144M6

144M1 Galvanometers, D. C. Exceedingly sensitive, double-pivoted instruments with sensitivities as low as 0.05 microamperes per division. Used in place of reflecting galvanometer. For many kinds of applications. Scale divisions 60-30 millimeters each side of zero.

Microamperes per division, approximate	**0.05**	**0.1**	**0.25**	**0.5**	**2.2**
Resistance of moving coil in ohms	4000	1000	150	50	3.5
External critical restance in ohms	60000	11500	1000	150	10
Period in seconds, approximate	2.7	2.7	2.7	2.5	2.3
Each	**$45.00**	**45.00**	**34.50**	**30.00**	**30.00**

144M2 Galvanometers, D. C., Student Model. With mounting base. Designed for use in school laboratories, and wherever a D. C. galvanometer of extreme sensitivity is not essential, but where great durability and moderate cost are factors. Usually supplied in the 45° angle base, but is also available without the base for mounting on apparatus or on panels. Permanent magnet moving coil type. Scale, 2.36 inches (60 mm.). Dimensions with base. 3¾x3$^{15}/_{32}$x3$^{17}/_{32}$ inches or 95x88x90 mm. Has a sensitivity of approximately 22 microamperes per division, which is the equivalent of one millimeter and a resistance of about 23 ohms. The scale is zero-center, calibrated 30-0-30 in millimeter divisions. **Each**............ **$9.75**

144M3 Galvanometers, D. C., Student Model. Same as 144M2, except without mounting base. Dimensions: Case, 3¼ inches (83 mm.); body, 2$^{9}/_{16}$ inches (65 mm.). **Each**............ **$7.50**

Miniature Precision D. C. Instruments. Used wherever miniature precision portable instruments are required for D. C. testing. Scales are hand calibrated and are provided with knife edged pointers and mirrors to eliminate parallax errors. These instruments are shielded from external magnetic fields. Dimensions, 4⅖x4⅗x1½ inches (112x117x38 mm.).

144M4 Ammeters, Miniature Precision, D. C.

Range, amperes	**1**	**3**	**10**	**15**	**50***	**100***	**150***
Scale division	50	60	50	75	50	50	75
Each	**$18.75**	**18.75**	**18.75**	**18.75**	**24.00**	**24.00**	**24.00**

*Provided with external shunt having a drop of 50 mv.

144M5 Milliammeters, Miniature, Precision, D. C.

Range, milliamperes	**5**	**10**	**25**	**50**	**100**	**150**	**300**	**500**	**750**
Scale division	50	50	50	50	50	75	60	50	75
Each	**$18.75**	**18.75**	**18.75**	**18.75**	**18.75**	**18.75**	**18.75**	**18.75**	**18.75**

144M6 Volt-Ammeters, Miniature, Precision, D. C.

Range, volts	**30/3/1.5**	**50/25/2.5**	**150/15/1.5**	**150/15/3**
Range, amperes	30/3/1.5	25/2.5/0.5	30/15/1.5	30/15/3
Scale divisions	60	50	60	60
Each	**$32.25**	**32.25**	**32.25**	**32.25**

144M7 Voltmeters, Miniature, Precision, D. C.

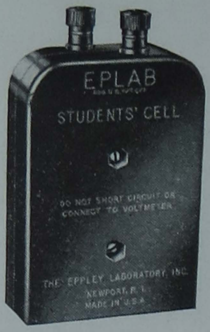
Range, volts	**10**	**15**	**30**	**75**	**150**
Scale division	50	75	60	75	75
Each	**$18.75**	**18.75**	**18.75**	**18.75**	**18.75**

144M8 Millivoltmeters, Miniature, Precision, D. C.

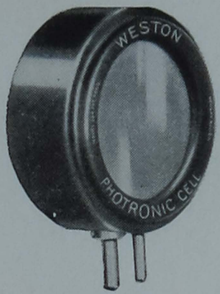
Range, millivolts	**50**	**100**	**150**	**500**	**750**
Scale division	50	50	75	50	75
Each	**$18.75**	**18.75**	**18.75**	**18.75**	**18.75**

144M9 Leather Cases. For instruments 144M4 to 144M8, inclusive. **Each**............ **$3.00**

Electrical Meters, Continued


EPLAB
STUDENTS' CELL
DO NOT SHORT CIRCUIT OR CONNECT TO VOLTMETER
THE EPPLEY LABORATORY, INC.
NEWPORT, R. I.
MADE IN U.S.A.

145M1



145M3

WESTON
D.C.
MINIATURE RELAY

145M4

145M1 Standard Cell, Eppley. Student type. For use in zero balance methods of potential measurement where an accuracy of ± 0.1% will suffice. Ends of the H-shaped glass container are sealed in the flame to insure against evaporation of the electrolyte. Mounted in a molded bakelite case with binding posts having non-detachable heads. Posts marked plus and minus to indicate polarity. Electromotive force of the cell is 1.018 volts. 0.1% at 20° C. Internal resistance not over 500 ohms. **Each** **$12.00**

145M2 Standard Cell, Eppley. Student type. Same as 145M1, except with addition of protective series resistance. **Each** . **$14.00**

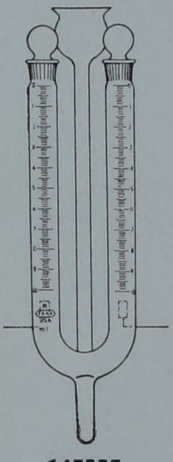
145M3 Photronic Cell, Electric. This photoelectric cell employs a highly light-sensitive metal disc which transforms light energy into electrical energy directly in proportion to the amount of light it receives. Its response to light variations is instantaneous and it develops sufficient current to directly operate Weston relays and instruments without the use of auxiliary apparatus, or any battery. As far as is known, the life of the cell is practically unlimited—it is subject to no chemical or physical change—has no dark current—is non-microphonic and is rugged in construction with nothing to get out of order. **Each** **$7.50**

145M4 Miniature Relay, Electric. Small relay of fair sensitivity for use on circuits where close selectivity is not required. It has a single set of silver contacts capable of handling 30 milliamperes at 4.5 volts direct current.

This relay is surface mounting with three rear terminals, the movable contact and the positive side of the operating coil being connected to a common terminal. The current value at which it operates may be adjusted within a range of about 10% of the operating value by changing the position of the movable contact. This is accomplished by turning a screw mounted in the glass face.

	Microamperes	Microamperes	Milliamperes
Range for closing contacts	300	500	Bet. 1 and 100
Each	**$10.15**	**10.15**	**9.40**

Electrolysis Apparatus

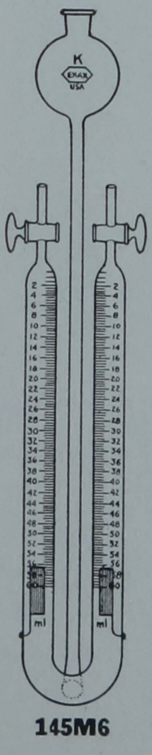


145M5

145M5 Electrolysis Apparatus, Exax Blue Line, Hoffman. For the decomposition of water. Glass parts only. The arms are graduated from 0 to 10 ml. in 1/10 ml. and are closed with a ground glass stopper.

Capacity, ml.	**10**
Graduated, ml.	1/10
Quantity in case	6
Each (See Note)	**$ 8.00**
Case	**$38.40**

Note: Electrodes are charged extra according to the market price of platinum.



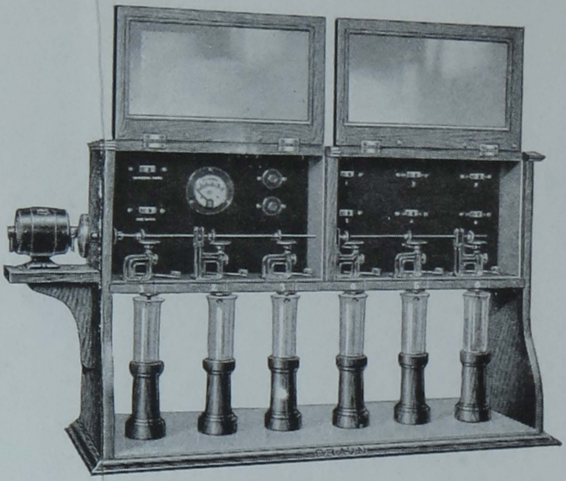
145M6

145M6 Electrolysis Apparatus, Exax Blue Line, Hoffman. For the decomposition of water. Glass parts only. The arms are graduated from 0 to 60 ml. in 1/5 ml. with the 0 at the stopcock.

Capacity, ml.	**60**
Graduated, ml.	1/5
Quantity in case	6
Each (See Note)	**$10.00**
Case	**$48.00**

Note: Electrodes are charged extra according to the market price of platinum.

Electrolytic Outfits



146M3

Electrolytic Outfits, Braun. For analyses of copper, lead, zinc, tin, cadmium, antimony and other metals.

Stirring: Agitation is simple, direct and efficient by rotation of the electrode itself. No supplementary mechanism required.

Drive: Universal motor—one line shaft for all units with unique self-aligning bearings. Separate friction drive from shaft for each unit with simple positive cut-outs so that units may be rotated independently.

Speed of rotation is regulated by a master rheostat in series with drive motor.

Controls: Tumbler switches, fuses and ammeter enclosed behind glass are all flush mounted on a black bakelite panel—grouped for easy access and convenient use.

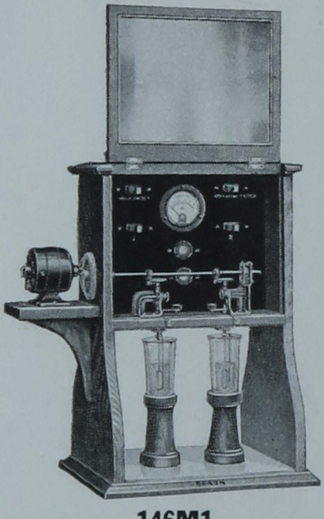
Electrolysis Current: Units are purposely in series so that current is read by one ammeter and controlled by one rheostat for all units. Each unit has a separate current cut-off switch. One master switch reverses the current for all units.

Fume Protection: Cabinet of oak; heavily covered with acid-proof varnish. Metal parts, except motor, electrodes and holders, enclosed and protected by hinged glass doors.

The under side of control cabinet is protected by aluminum—binding posts are of same metal. Base is covered by plate of white opalite.

Motor and Wiring: Regular equipment includes a 110-volt Universal A. C. and D. C. Motor (motor for 220 volts can be supplied if desired, at same price.) Wired for 5 amperes.

Current Supply D. C.: Direct current is necessary for electrolysis. Where alternating current only is available a motor generator set is required to convert alternating current to direct.



146M1

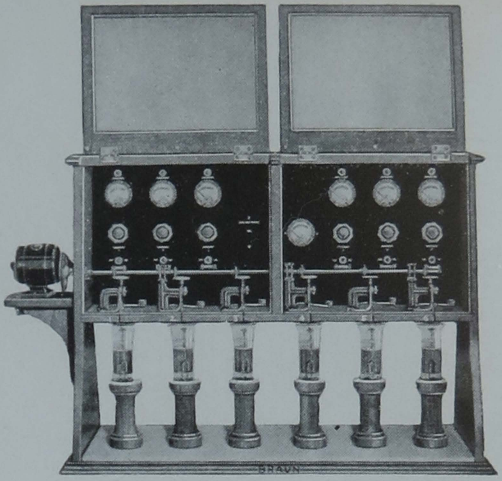
Cabinets equipped with motor, ammeter, two rheostats (one for motor control and one for electrolysis current), but without platinum anodes and cathodes or motor generator.

146M1 Electrolytic Outfits. Two units. Cabinet dimensions, inches: length, 22; width, 14; height, 25; shipping weight, 170 pounds. **Each** **$230.00**

146M2 Electrolytic Outfits. Same as 146M1, except with 4 units. Cabinet dimensions, inches: length, 32; width, 14; height, 23; shipping weight, 180 pounds. **Each** **$255.00**

146M3 Electrolytic Outfits. Same as 146M1, except with 6 units. Cabinet dimensions, inches: length, 40; width, 14; height, 23; shipping weight, 195 pounds. **Each** **$280.00**

See page 318 for platinum anodes and cathodes.



146M6

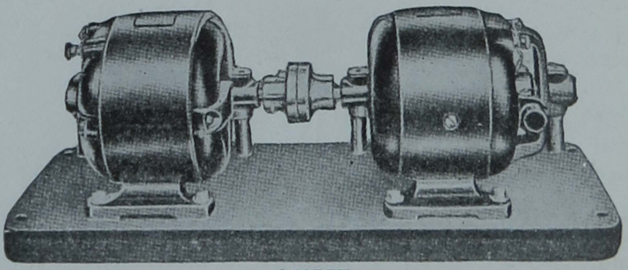
Electrolytic Outfits, Braun. Designed for simultaneous determinations of copper, lead, cobalt, and other metals in ores and alloys where the quantities and characteristics in each analysis are quite different. Each unit operates independently of the others, and can be put into operation or disconnected from the circuit without disturbing the remaining units in any way. Very valuable where analyses are not limited to a single type of determination. Constant voltage 6-volt direct current is required. If only alternating current is available a motor generator set is necessary. Small motor on the side of the cabinet rotates the anodes. Motor supplied for either A. C. or D. C. 110-volt current. Positive clutch releases on each unit permit electrodes to be rotated independently. Speed is controlled by a master rheostat.

For anodes and cathodes, see page 318.

146M4 Electrolytic Outfits. 2 Unit. Complete with drive motor, control rheostat, master voltmeter, individual ammeters, and glassware, but without electrodes or motor generator. Cabinet dimensions: length, 22 inches; width, 14 inches; height, 25 inches. Shipping weight, 170 pounds.
Each **$245.00**

146M5 Electrolytic Outfits. Same as 146M4, except with 4 units. Dimensions: length, 32 inches; width, 14 inches; height, 25 inches. Shipping weight, 180 pounds.
Each **$285.00**

146M6 Electrolytic Outfits. Same as 146M4, except with 6 units. Dimensions: length, 40 inches; width, 14 inches; height, 25 inches. Shipping weight, 190 pounds.
Each **$315.00**



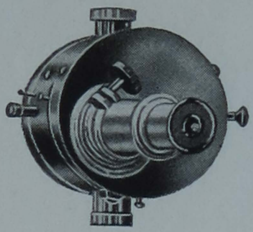
146M7

Motor Generator Sets. Develops 8 volts which gives constant 6-volt current with no voltage drop. Approximate shipping weight, 150 pounds.

146M7 Motor Generator Set. Input: 110-volt A. C. 60 cycle: output; 8-volt D. C. **Each** **$95.00**

146M8 Motor Generator Set. Input: 110-volt D. C. output; 8-volt D. C. **Each** **$105.00**

Electroscopes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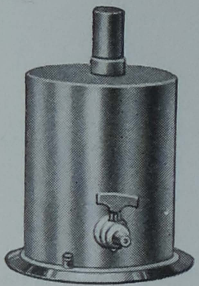
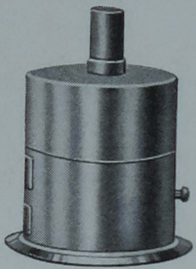
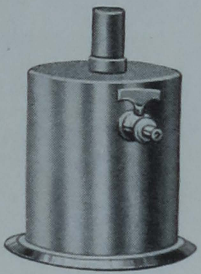

147M3
Front


147M1 & 147M2


147M3
Rear

Electroscopes, Lind. Interchangeable. Used to quickly determine radio-activity. Test can be made in a couple of minutes without preparing the sample. If ore is found active a quantitative determination is made by crushing and comparing its influence on electroscope with that of a standard sample. Lind electroscope head can be used with any number or type of emanation chambers. Special chambers, however, have been designed for convenience in testing activity of solids, liquids or gases.

147M1 Electroscope Head. Chromium plated housing containing the leaf system and providing fixed position for standard microscope. Glass front and back plates are covered with fine wire grating to ground stray charges. Sodium drying bulb dehydrates air in the head, thus reducing natural electrical leakage to a minimum. Leaf system is insulated with pure amber, the standard microscope is equipped with micrometer scale in eye piece by which motion of leaf is measured to 1/10 mm. **Each** **$63.00**

147M2 Electroscope Open Discharge Chambers for Solids. Cylinder is mounted on metal base fitted with door for convenience in inserting any solid material to be tested. Plate electrode is supported horizontally just below top of chamber by a rod that passes through a double amber insulation and terminates in a cap that fits electroscope head. Chamber is provided with a dust cap to protect insulation when not in use. **Each** **$13.00**

147M3 Electroscope Emanation Chamber. Cylinder used with 147M1 for making radio-active measurement by emanation method. Made of heavy brass to stand vacuum; provided with two gas-tight stopcocks. Double amber insulation is made gas-tight by a special mechanical joint. Duplicate emanation chambers in number desired for daily determinations must be provided, since each chamber can be used only once daily, all being used with the same electroscope head. At least one extra charging cap is needed with each extra chamber. Approximate capacity of standard chamber, ½ liter. **Each** **$15.00**

147M4 Electroscope Plate for Solids. For exposing the same surface of two different ores to the discharge plate of the electroscope. With narrow rim. To be used with 147M2. At least two are desirable. **Each** .... **$ .75**

147M5 Electroscope Charging Rod, Hard Rubber. For charging in field work and where battery is not available. Tapering 8 inches long. **Each** .... **$ .40**

147M6 Electroscope Charging Cap. For use in maintaining charge on duplicates of 147M3 when head, 147M1, is in other use. Small; hard rubber; with binding post. **Each** **$1.15**

147M7 Carnotite, Analyzed. With certificate.

Per cent U_3O_8, approximate..................	1.5	2	3
For 25 grams..................	**$1.50**	**2.00**	**2.50**

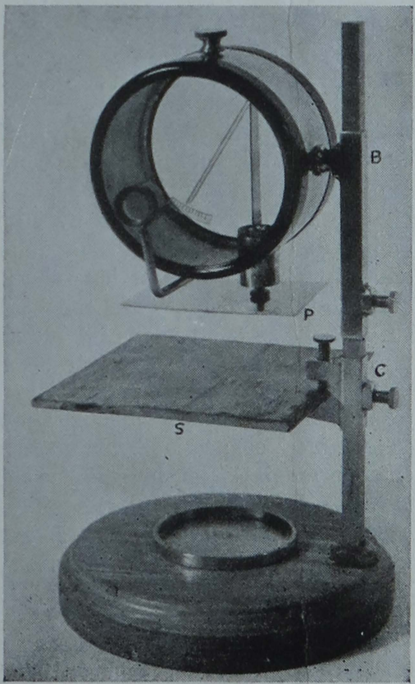
147M8 Electroscopes, Hammer. With adjustable head. For making radio-active tests; alpha ray, beta ray, gamma ray; for radon demonstrations; for X-ray and other ionization experiments. By swinging reading lens to right, leaf system, by means of a projection lantern may be thrown upon wall or screen. Instrument is made of brass, nickel-plated, with 3-inch head, having 1/16th inch walls and 5-inch base. Head is attached to a square sleeve bracket which fits over a close-fitting standard permitting adjustment of collector plate from ½ to 7 inches from base. Leaf is 2 inches long. Glass windows are removable. Directions are furnished with each instrument.

Complete with standard analyzed carnotite, set of 6 radio-active plaques, adjustable sleeve clamp, 2 lead screens, 2 aluminum screens, 2 ounces of high-grade carnotite, dish for solids, hard rubber charging rod, lens and scale for reading drop of leaf. **Each** **$12.50**

147M9 Electroscopes, Hammer. Same as 147M8, except without lead screen, "S", and clamp, "C." **Each** **$7.50**

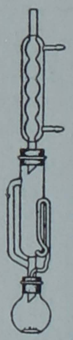
147M10 Electroscope Dish for Solids. Each .... **$ .25**

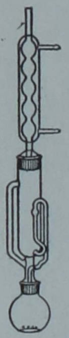
147M11 Electroscope Leaves, Aluminum. Leaves approximately ¼-inch wide by 3 inches long. For above electroscopes. Book of 20 leaves.................. **$ .25**

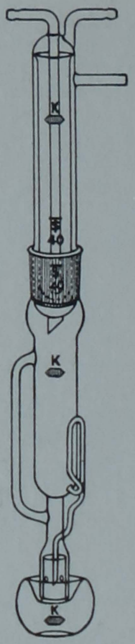


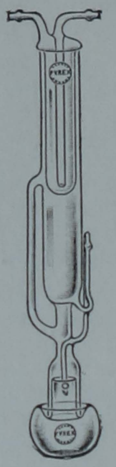
147M8

Extraction Apparatus


148M1


148M2


148M3


148M4

148M1 Extraction Apparatus, Soxhlet. Complete, consists of Allihn type condenser with bulbs, Soxhlet condenser tube and extraction flask; fitted together with close grained corks.

Diameter, inside, extractor tube mm.	**30**	**38**	**50**
Capacity, flask, ml.	100	150	250
Each	**$ 3.40**	**3.75**	**4.20**
Case of 6	**$18.36**	**20.25**	**22.68**

148M2 Extraction Apparatus, Soxhlet. Complete, consists of Allihn type condenser with bulbs, Soxhlet condenser tube and two extraction flasks; connected by interchangeable ground glass joints.

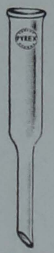
Diameter, inside, extractor tube mm.	**30**	**38**	**50**
Capacity, flask, mm.	100	150	250
Number of joint bet. tube and flask Ŧ	20	20	20
No. of joint bet. tube and condenser Ŧ	30	40	50
Each	**$ 7.50**	**8.50**	**10.00**
Case of 3	**$20.25**	**22.95**	**27.00**

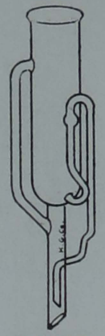
148M3 Extraction Apparatus, Soxhlet-Hopkins. Complete with 100 ml. Knorr flask, extraction tube of 38 mm. inside diameter, and Hopkins condenser. The condenser is connected to the extraction tube by an interchangeable joint, Number 40, complying with the requirements of Commercial Standard CS21. The extraction tube has an adapter at the bottom so that a mercury seal can be used between tube and flask. **Each, $8.60.** **Case** of 3. . . . . **$23.22**

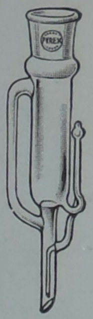
148M4 Extraction Apparatus, Binnington, Pyrex. Improved form of extraction apparatus in which all ground joints are eliminated, connection being made between tube and flask by mercury seal. Apparatus supplied complete with two flasks.

Diameter, body tube, mm.	**37**
Length, body tube, mm.	280
Capacity flask, ml.	100
Each	**$ 9.10**
Case of 4	**$32.76**

For separate condensers, see page 109.
For separate flasks, see page 163.


148M5


148M6


148M7

148M5 Extraction Tubes, Pyrex. Plain form. For use in such extractions as cotton seed meal with petroleum ether.

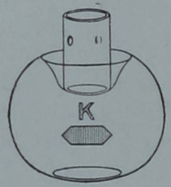
Diameter, body, mm.	**32**
Length, total, mm.	230
Length, body, mm.	125
Each	**$ .55**
Case of 36	**$17.82**

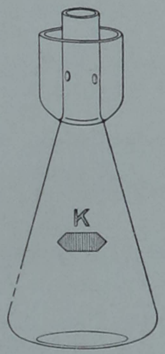
148M6 Extraction Tubes, Soxhlet. Plain form for cork connections.

Diameter, tube, inside, mm.	**30**	**38**	**50**
Height, siphon tube, mm.	70	75	113
Each	**$ 1.75**	**2.00**	**2.30**
Case of 12	**$18.90**	**21.60**	**24.84**

148M7 Extraction Tubes, Soxhlet, Pyrex. Plain form for cork connections.

Diameter, body tube, mm.	**30**	**40**	**50**
Length, body tube, mm.	190	205	250
Each	**$ 3.00**	**3.40**	**3.80**
Case of 6	**$16.20**	**18.36**	**20.52**


148M9


148M10

148M8 Extraction Flasks, Knorr. With flat bottom. With a depression in the top of the flask around the neck, so that a mercury seal can be used. The neck of the flask has one hole.

Capacity, ml.	100
Each	**$ .50**
Case of 24	**$10.80**

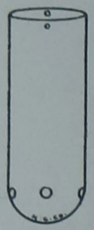
148M9 Extraction Flasks, Knorr. Same as 148M8, except with two holes in the neck.

Capacity, ml.	100
Each	**$ .60**
Case of 24	**$12.96**

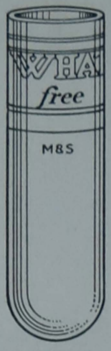
148M10 Extraction Flasks, Sy. These flasks are to be used with mercury seals. The body is shaped like an Erlenmeyer flask. The neck has two holes. The cups of all sizes have the same dimensions.

Capacity, ml.	100	150	250
Each	**$ .90**	**1.00**	**1.10**
Case of 24	**$19.44**	**21.60**	**23.76**

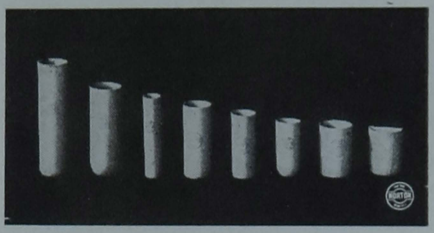
Extraction Apparatus, Continued



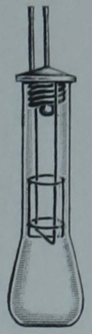
149M1



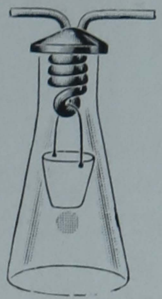
149M2



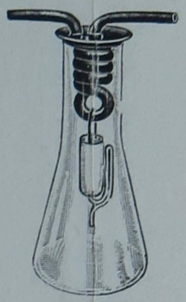
149M4



149M7



149M10



149M13

149M1 Extraction Shells, Glass. With straight sides and round bottom. With two holes near the top for suspension.

Diameter, outside, mm.	**25**	**33**	**43**
Height, overall, mm.	80	80	123
Each	**$ .45**	**.50**	**.60**
Case of 36	**$14.58**	**16.20**	**19.44**

Extraction Thimbles, Whatman. Made of high-grade material and fat extracted by a special process. May be used repeatedly. Single and double thickness. Single thickness allows very rapid extraction. Double thickness will retain the finest precipitates. In single thickness, Size 2 conforming to Standard Underwriters' requirements; Size 4 to **A. S. T. M. D-147, D-296, and D-297;** Size 6 to **A. S. T. M. D-29.** Packed in sealed boxes containing 25 thimbles.

Size	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Diameter, inside, mm.	10	19	19	22	22	26	25	25	30	30	33	33	33	43
Length, inside, mm.	50	50	90	65	80	60	80	100	77	100	80	94	118	123
149M2 Single thickness. Box	**$3.15**	**3.15**	**3.15**	**3.15**	**3.15**	**3.15**	**3.50**	**4.35**	**3.50**	**4.35**	**3.50**	**4.35**	**5.95**	**7.00**
149M3 Double thickness. Box	**$5.25**	**5.25**	**5.25**	**5.25**	**5.25**	**5.25**	**5.90**	**7.25**	**5.90**	**7.25**	**5.90**	**7.25**	**9.90**	**11.70**

Extraction Thimbles, Alundum. Supplied in sizes suitable for use with the standard types of extraction apparatus. Remain constant in weight, may be used an indefinite number of times and permit the ignition of the extracted residue without removing the material from the thimble. To clean, it is only necessary to place it in a strong solution of acid for a short length of time and then ignite it to constant weight in the usual way. Wall is usually 1 mm. in thickness. Made in dense, RA 84, medium, RA 360, and coarse, RA 98 porosities. Size 6 in coarse porosity conforms to **A. S. T. M. D-367** and **D-306.**

Size	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Diameter, outside, mm.	6	19	20	25	26	30	34	35	45	50
Height, mm.	32	90	150	70	60	80	100	55	127	165
Shape, bottom	Round	Flat	Round	Flat	Round	Flat	Round	Flat	Round	Flat
149M4 Dense. Each	**$ .30**	**.45**	**.70**	**.50**	**.50**	**.50**	**.60**	**.50**	**.70**	**.85**
149M5 Medium. Each	**$ .30**	**.45**	**.70**	**.50**	**.50**	**.50**	**.60**	**.50**	**.70**	**.85**
149M6 Coarse. Each	**$ .30**	**.45**	**.70**	**.50**	**.50**	**.50**	**.60**	**.50**	**.70**	**.85**

149M7 Extraction Apparatus. A. S. T. M. D-367 and **D-306.** For determining insoluble matter in creosote oil; also used in Barrett Methods B7, C5, D5 and H5. Consists of extraction condenser with flask and German silver wire basket. Without thimble.
Each **$3.50**

149M8 Extraction Flasks, Pyrex. For extraction apparatus, 149M7. **Each** .... **$ .50**

149M9 Extraction Condensers. For extraction apparatus, 149M7. **Each** **$2.25**

149M10 Extraction Apparatus. Underwriters' Type. With Gooch crucible. Used in extraction of insulating coverings. It employs an Erlenmeyer form glass extraction flask, a coiled block tin condenser with cone shaped flanged cover and a 10 ml. porcelain Gooch crucible suspended from the condenser by a wire. Capacity, 200 ml. Complete with condenser and crucible.
Each **$2.10**

149M11 Extraction Condensers. For extraction apparatus, 149M10. **Each** **$1.60**
Note: For Gooch suspension crucibles, see page 114.

149M12 Extraction Flasks, Pyrex. For extraction apparatus, 149M10. Capacity, 200 ml. **Each** .... **$ .28**

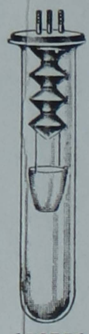
149M13 Extraction Apparatus, Underwriters' Modified Type. A. S. T. M. D-147, D-231, D-296 and **D-297.** The specifications are also in accordance with those of the National Bureau of Standards, letter circular Number 74. It employs a coiled block tin condenser with a depressed plate and an extraction cup. The flask is Pyrex glass, 400 ml. capacity. Extraction cup is 70 mm. in height and 28 mm. in inside diameter and provided with two holes for suspension by means of wire from the condenser.
Complete **$3.00**

149M14 Extraction Condensers. For extraction apparatus 149M13. **Each** **$2.25**

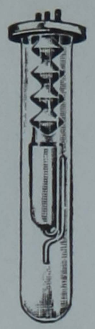
149M15 Extraction Cups, Siphons. For extraction apparatus 149M13. **Each** .... **$ .60**

149M16 Extraction Flasks, Pyrex. For extraction apparatus, 149M13. Capacity, 400 ml. **Each** .... **$ .30**

Extraction Apparatus, Continued



150M1



150M2

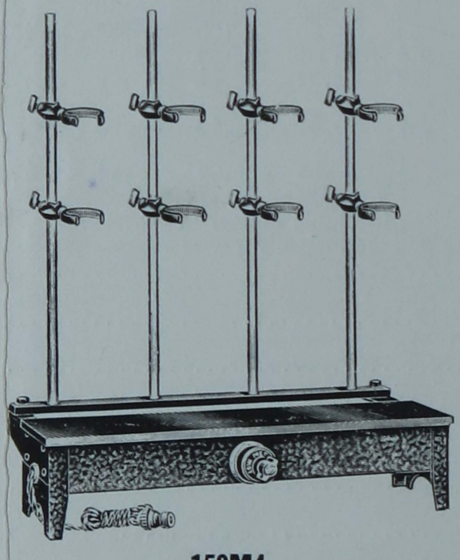
150M1 Extraction Apparatus, Wiley. Employs a long cylindrical boiling vessel with an inserted four-bulb metal condenser resting on a ground flange and a 25 ml. porcelain Gooch crucible as sample container. The latter is suspended from the condenser by wire. The condenser is made of copper, nickel plated outside and heavily tinned inside. It is fitted with two nipples for water connections and a third for vent. Length of boiling vessel, 275 mm.; inside diameter of boiling vessel, 47 mm. **Complete**.................. **$7.00**

For Gooch Crucible with suspension holes, see page 114.

150M2 Extraction Apparatus, Wiley-Richardson. Same as 150M1, except equipped with a glass siphon instead of the Gooch crucible. **Each**............................ **$7.25**

For Extraction Siphon, see page 149.

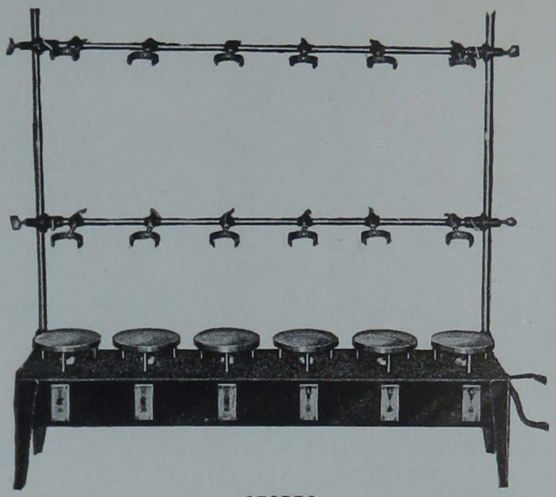
150M3 Extraction Condensers, Only. For 150M1 and 150M2 extraction apparatus. **Each**................ **$6.00**



150M4

150M4 Extraction Racks, Electric. 600-watt hot plate with three-heat switch control equipped with four removable stainless steel support rods and eight clamps with spring bronze clips. Hot plate size, 4½ inches wide by 23½ inches long; center distance between supports, 5⅞ inches; overall height, 30 inches. Complete for 110 volts with 6 feet of asbestos covered cord and plug. **Each**........................ **$42.50**

150M5 Extraction Racks, Electric. Same as 150M4, except for 220 volts. **Each**........................ **$42.50**



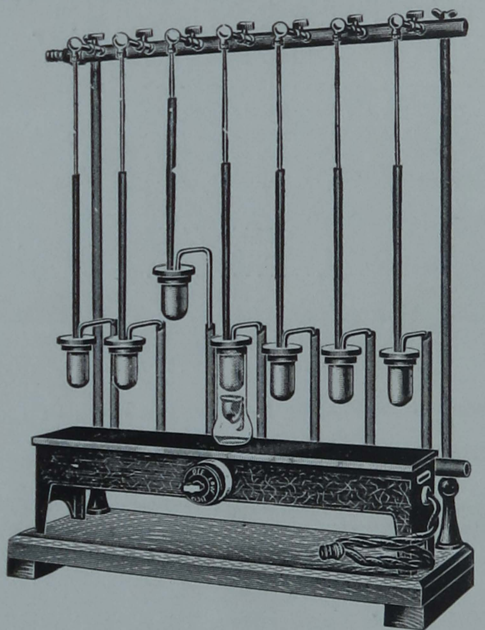
150M6

150M6 Extraction Racks, Electric. For multiple extraction work, using the Soxhlet or other types of extractors. It is also suitable for saponification number of oils, A. S. T. M. D-94. Consists of six individual hot plates, each $4\frac{3}{16}$ inches in diameter, wound for 300 watts and provided with individual snap switches.

The base has two upright rods on which are attached two horizontal rods, each fitted with 6 clamps, made especially for extraction glassware. Clamps and rods are adjustable and removable.

Length, 30 inches; depth, 7 inches; height, 30 inches. Height to top of hot plates, $8\frac{5}{8}$ inches. Complete for 110 volts and direct connection to current supply. **Each**.. **$85.00**

150M7 Extraction Racks. Same as 150M6, except for 220 volts. **Each**.................................. **$85.00**



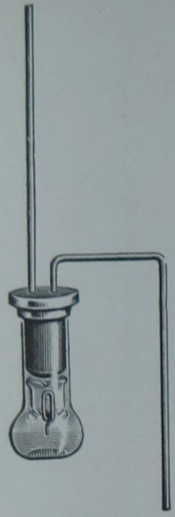
150M8

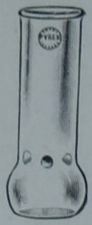
150M8 Extraction Racks, Electric, Bailey-Walker. For making extractions where a number are to be made at one time. The electric heater is 24 inches long and 4½ inches wide. A single switch connects for low, medium or full heat as wished. Current consumption, 600 watts.

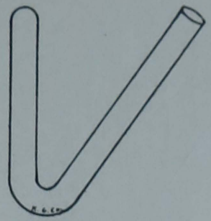
If desired, a 25 ml. porcelain filtering crucible may be used with this apparatus in place of the siphon-cup.

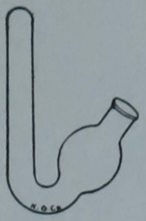
Complete outfit with electric heater, support, water supply manifold with seven stopcocks, waste manifold with seven branches and seven complete Bailey-Walker extractors. With connecting cord and plug. For 110-volt current. **Each**.. **$71.50**

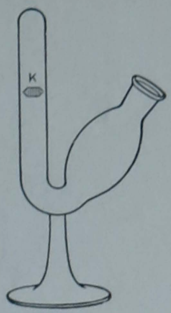
150M9 Extraction Racks, Electric, Bailey-Walker. Same as 150M8, except for 220 volts. **Each**.............. **$71.50**

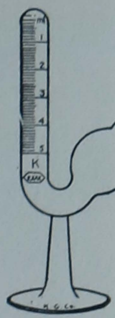

151M1

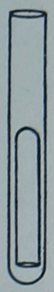

151M5


151M6


151M7


151M9


151M11


151M12

151M1 Extraction Apparatus, Bailey-Walker. Consists of a metal condenser, syphon and glass flask. **Each** **$4.00**

151M2 Condenser, Only. Each **$3.00**

151M3 Syphon Cup, Only. Each .... **$ .70**

151M4 Flask, Only. Each .... **$ .40**

151M5 Extraction Flasks, Pyrex, Bailey-Walker. Top diameter has been reduced to a minimum to assure a uniform fit with the standard metal condenser. Total height, 160 mm. **Each, $ .75. Case** of 36 .. **$24.30**

151M6 Fermentation Tubes, Fish Hook Type. Without foot or bulb. The vertical tube is 12 to 13 mm. outside diameter and 100 mm. high. **Each, $ .09. Case** of 144 .... **$11.66**

151M7 Fermentation Tubes, Small Size. Without foot. The vertical tube is 12 to 13 mm. outside diameter and 100 mm. high; the bulb is made to have capacity greater than that of the vertical tube. **Each, $ .18. Case** of 72 .... **$11.66**

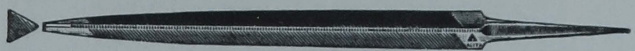
151M8 Fermentation Tubes. A. P. H. A. Same as 151M7, except large size. Without foot. The inside diameter of the vertical tube is approximately 15 mm.; the length is 140 mm.; the outside diameter of the bulb is 38 mm. **Each, $ .20. Case** of 72. **$12.96**

151M9 Fermentation Tubes, Small Size. With glass foot. The vertical tube is 12 to 13 mm. outside diameter; and 100 mm. high; the bulb is made to have a capacity greater than that of the vertical tube. **Each, $ .30. Case** of 48 .... **$12.96**

151M10 Fermentation Tubes. A. P. H. A. Same as 151M9, except large size. With glass foot. The inside diameter of the vertical tube is approximately 15 mm.; the length is 140 mm.; the outside diameter of the bulb is 38 mm. **Each, $ .34. Case** of 48 .... **$14.69**

151M11 Fermentation Tubes, Exax Blue Line. With glass foot. Graduated from 0 to 5 ml. in 1/10 ml. **Each, $1.00. Dozen, $10.80. Case** of 36 .... **$28.80**

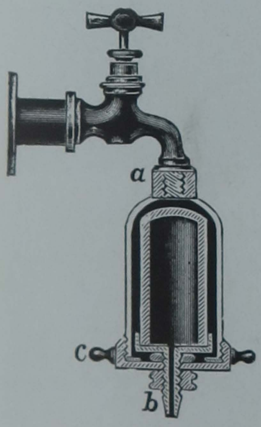
151M12 Fermentation Tubes, Dunham. Set consists of a culture tube 150x16 mm., containing a small tube 75x10 mm., without lip. **Dozen** .... **$ .50**


151M13

151M13 Files, Triangular. For cutting glass tubing.

Length, inches	3	4	5	6
Each	**$ .05**	**.05**	**.06**	**.08**

Filter Apparatus

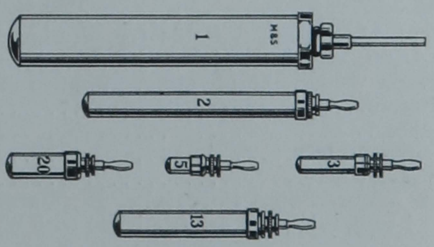


151M14

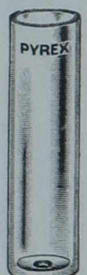
151M14 Filters, Berkefeld. Consists of a nickel-plated metal case in which is contained a filter cylinder. With pipe threads for use on 3/4-inch bibb faucet. Diameter, 2¾ inches; length, 6½ inches; capacity, one gallon in 4 minutes at 40 pounds pressure. **Each** **$9.50**

151M15 Filter Cylinder, Only. With metallic headpiece. **Each** **$3.00**

151M16 Wrench, Only. For removing cylinder of Berkefeld filter. **Each** .... **$ .40**



151M17



151M20

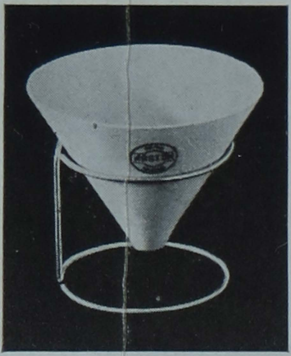
Filter Cylinders, Berkefeld. For use in filtering antitoxins, serums, vaccines, etc. All headpieces are metal except size 24 which is porcelain. Supplied in three grades of porosity: coarse, medium and dense.

Size	**1**	**2**	**3**	**5**	**13**	**20**	**24**
Diameter, inches	2	1	⅝	⅝	1	1	2
Length, inches	10	8	2½	¾	5	2¼	10
151M17 Coarse. Operating pressure, 2-5 pounds. **Each**	**$7.00**	**6.00**	**3.50**	**3.00**	**5.00**	**3.50**	**7.50**
151M18 Medium. Operating pressure, 6-9 pounds. **Each**	**$7.00**	**6.00**	**3.50**	**3.00**	**5.00**	**3.50**	**7.50**
151M19 Dense. Operating pressure, 10-16 pounds. **Each**	**$7.00**	**6.00**	**3.50**	**3.00**	**5.00**	**3.50**	**7.50**

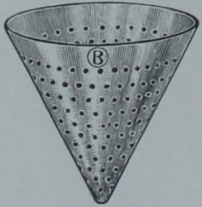
151M20 Filter Mantles, Pyrex. For use with Mandler or Berkefeld filter cylinders.

Diameter, inches	4⅜	2¾	2¾	1¼	1¼
Length, inches	13¼	11	5⅝	4⅜	2½
Quantity in case	24	36	36	36	36
Each	**$1.20**	**1.00**	**.90**	**.75**	**.60**
Case	**$25.92**	**32.40**	**29.16**	**24.30**	**19.44**

Filter Apparatus, Continued



152M1

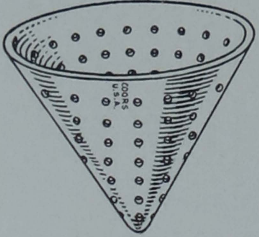


152M4

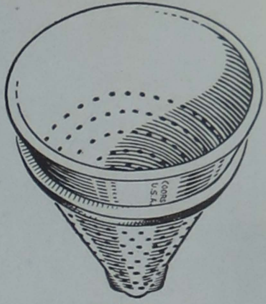
Filter Cones, Alundum. Fit the ordinary 60° funnel. May be ignited and weighed with accuracy. Light aluminum stands are supplied with the cones for supporting them on the balance pan without extra charge, but if wanted must be specified on each order. Cone is held properly by stretching a rubber gasket over the top of the funnel before introducing the cone. In this way a large proportion of the surface of the funnel presents a filtering area for a rapid removal of solid particles from liquids. Supplied in three grades of porosity: dense, RA 320; medium, RA 321; and coarse, RA 322.

Capacity, ml.	**20**	**50**	**100**	**250**
Diameter, inches	1¾	2½	3	4½
Height, inches	1 5/16	1⅞	2 7/16	3½
152M1 Dense. Each	**$ .40**	**.50**	**.65**	**1.25**
152M2 Medium	**$ .40**	**.50**	**.65**	**1.25**
152M3 Coarse. Each	**$ .40**	**.50**	**.65**	**1.25**

152M4 Filter Cones, Nickel, Perforated. Supports filter paper at the bottom of a 60° funnel. Recommended especially for vacuum filtration of heavy alkaline precipitates. Seamless polished nickel. Diameter, top, 1⅝ inches. Depth, 1⅜ inches. **Each** **$3.00**



152M5



152M6

152M5 Filter Cones, Coors Porcelain. Glazed inside and outside with exception of rim.

Size	**3**	**4**
Diameter, mm.	50	63
Height, mm.	43	50
Diameter holes, mm.	2	2
Each	**$1.00**	**1.20**

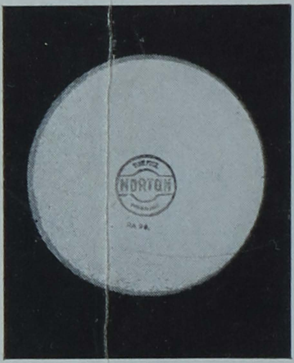
152M6 Filter Cones, Coors Porcelain. With shoulder and rubber ring. Glazed inside and outside with exception of rim.

Size	**1**
Diameter, mm.	60
Height, mm.	50
Diameter of holes, mm.	0.5
Each	**$1.10**

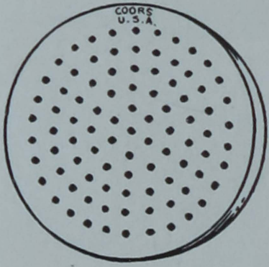
152M7 Rubber Rings. For 152M6. **Each** . . . . **$ .20**

152M8 Filter Cones, Whatman Number 51. Made of hardened paper. In the form of semi-circular discs of special shape. For use with filter pump as a substitute for platinum cones. Packed in boxes containing 100 circles.

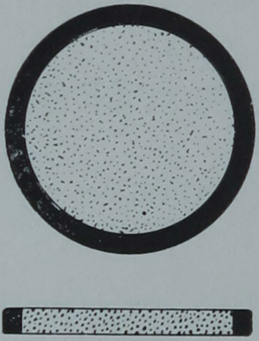
Diameter, cm.	5.5	7	9	11	12.5	15	18.5	24
Each	**$ .70**	**.90**	**1.35**	**1.60**	**1.80**	**2.10**	**2.75**	**4.70**



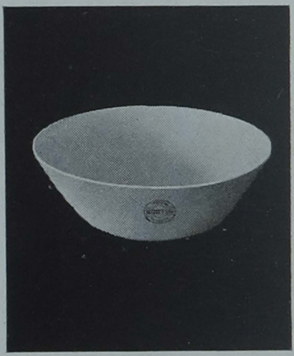
152M9



152M11



152M12



152M14

Filter Discs, Alundum, Suitable for filtering small amounts of solid matter present in a large volume of liquid. Fits 60° glass funnels. Often substituted for an asbestos filter mat, the edge being sealed by asbestos fibre or a suitable cement. Readily cleaned by reverse washing and heating. Supplied in two grades of porosity: medium, RA 225, and coarse, RA 98.

Diameter, inches	**¾**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Thickness, inches	1/16	1/16	3/32	⅛	3/16	3/16	3/16	¼	¼
152M9 Medium. Each	**$ .40**	**.40**	**.40**	**.45**	**.55**	**.65**	**.85**	**1.15**	**1.25**
152M10 Coarse. Each	**$ .40**	**.40**	**.40**	**.45**	**.55**	**.65**	**.85**	**1.15**	**1.25**

152M11 Filter Discs, Coors Porcelain. Perforated for Caldwell crucibles and for funnels, glazed with exception of edge and bottom. Sizes 4 to 9, inclusive, are furnished with 60° beveled edge.

Size	**00**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**6A**	**7**	**8**	**9**	**10**	**11**
Diameter, mm.	10.5	15	18	20	22	25	30	38	40	50	60	75	100	150
Thickness, mm.	1.5	2	2	2	2	3.5	4	4	4	4	4	4	6	6
Diameter, perforations, mm.	0.5	0.5	0.5	0.5	0.5	1	1	1	2	1	1	1	1	1
Each	**$.20**	**.20**	**.22**	**.22**	**.24**	**.24**	**.27**	**.37**	**.41**	**.44**	**.50**	**.66**	**1.00**	**1.55**

Filter Discs, Jena Fritted Glass. Of sintered glass, edge centered, ground plane on both sides. Supplied in two grades of porosity, dense and medium.

Diameter, mm.	60	120
152M12 Dense. Each	**$1.45**	**6.50**
152M13 Medium. Each	**$1.45**	**6.50**

Filter Dishes, Alundum. For retaining large quantities of such residues as are encountered in organic preparations and similar work. Supplied in three grades of porosity: dense, RA 84; medium, RA 360; and coarse, RA 98.

Capacity, ml.	**50**	**150**
Diameter, inches	2½	4
Depth, inches	1	2
152M14 Dense. Each	**$ .45**	**1.10**
152M15 Medium. Each	**$ .45**	**1.10**
152M16 Coarse. Each	**$ .45**	**1.10**

Filter Papers

The Mine & Smelter Supply Co.
FAST FILTERING
WHITE CREPE TEXTURE
100 Sheets
MASSCO SPECIAL
FILTER PAPER
No. 153M1
SIZE
DENVER • SALT LAKE CITY • EL PASO

153M1

Reeve Angel
Genuine American
FILTER PAPER
Creped surface white paper of open texture; rapid filtering
H. REEVE ANGEL & CO.
INCORPORATED
NEW YORK
Nº 202

153M8

Reeve Angel
FILTER PAPER
Embossed white paper of extreme rapidity and great purity.
H. REEVE ANGEL & CO.
INCORPORATED
NEW YORK
Nº 711

153M9

153M1 Filter Papers, Massco Special, White. Creped surface, open texture, rapid and retentive. For general use in schools and industrial laboratories.

Diameter, inches	**2¼**	**3**	**3½**	**4**	**4⅜**	**5**	**5⅜**	**6**	**7**
Diameter, cm.	5.5	7.5	9	10	11	12.5	13.5	15	18
Package of 100	**$ .09**	**.09**	**.11**	**.12**	**.13**	**.15**	**.17**	**.20**	**.26**

Diameter, inches, continued	**7½**	**8**	**10**	**12½**	**13**	**15**	**18**	**20**
Diameter, cm.	19	20	25	32	33	40	45	50
Package of 100	**$ .29**	**.31**	**.50**	**.75**	**.85**	**1.10**	**1.60**	**1.90**

153M2 Filter Papers, Massco Special, Square, White. Creped surface, open texture, in square sheets.

Size, inches	20x20	24x24	36x36
Ream of 500 sheets	**$6.50**	**9.15**	**20.50**

153M3 Filter Papers, White. Smooth surface, close texture, fairly rapid and very retentive. For general chemistry and qualitative analysis.

Diameter, inches	**3**	**3½**	**4**	**4⅜**	**5**	**5⅜**	**6**	**7**	**8**	**10**	**13**
Diameter, cm.	7.5	9	10	11	12.5	13.5	15	18	20	25	33
Package of 100	**$ .09**	**.11**	**.12**	**.13**	**.15**	**.17**	**.20**	**.26**	**.31**	**.50**	**.85**

153M4 Filter Papers, White. Creped surface, open texture. A heavy, strong paper used for filtering extracts, biological products, oils, etc.

Diameter, inches	**3**	**3½**	**4⅜**	**5**	**6**	**7¼**
Diameter, cm.	7.5	9	11	12.5	15	18.5
Package of 100	**$ .15**	**.18**	**.27**	**.29**	**.38**	**.42**

153M5 Filter Papers, Gray. Creped surface, open texture, rapid filtering. Used in sugar laboratories.

Diameter, inches	**4**	**4⅜**	**5**	**6**	**7**	**8**	**10**	**13**	**15**	**18**	**20**
Diameter, cm.	10	11	12.5	15	18	20	25	33	40	45	50
Package of 100	**$ .12**	**.13**	**.15**	**.20**	**.25**	**.30**	**.50**	**.80**	**1.00**	**1.50**	**1.75**

153M6 Filter Papers, Square, White. Smooth surface, close texture. Used in sugar laboratories.

Size, inches	6x6	7x7	7½x7½	8x8	13x13	20x20

Prices furnished on request.

153M7 Filter Papers, Square, Gray. Creped surface, open texture, rapid filtering. Used in sugar laboratories.

Size, inches	6x6	7x7	7½x7½	8x8	13x13	20x20

Prices furnished on request.

153M8 Filter Papers, Reeve Angel No. 202, White. Creped surface, open texture, rapid filtering. For general chemistry and qualitative analysis.

Diameter, inches	**3½**	**4**	**4⅜**	**5**	**6**	**7¼**	**8**	**10**	**13**	**15**	**18**
Diameter, cm.	9	10	11	12.5	15	18.5	20	25	33	40	45
Package of 100	**$ .11**	**.12**	**.13**	**.15**	**.20**	**.27**	**.31**	**.50**	**.85**	**1.10**	**1.60**

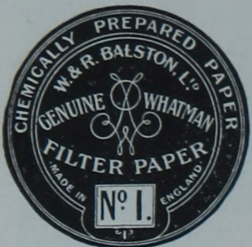
153M9 Filter Papers, Reeve Angel No. 711, Embossed, White. Embossed surface, open texture, rapid filtering. For gelatinous precipitates. Can be washed repeatedly.

Diameter, inches	**3½**	**4⅜**	**5**	**6**	**7¼**	**10**
Diameter, cm.	9	11	12.5	15	18.5	25
Package of 100	**$ .25**	**.35**	**.45**	**.65**	**.85**	**1.60**

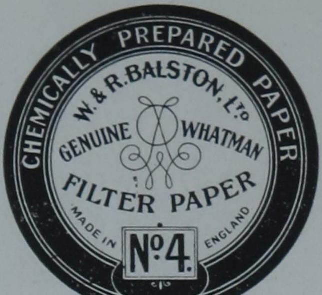
153M10 Filter Papers, Reeve Angel No. 214, White. Rapid filtering and retentive. For general analysis and excellent for yellow precipitates or phosphorous determinations. Washes well and pulps easily for titrations.

Diameter, inches	**3½**	**4⅜**	**5**	**6**	**7¼**	**8**	**10**	**13**
Diameter, cm.	9	11	12.5	15	18.5	20	25	33
Package of 100	**$ .30**	**.40**	**.55**	**.75**	**1.00**	**1.30**	**1.85**	**3.10**

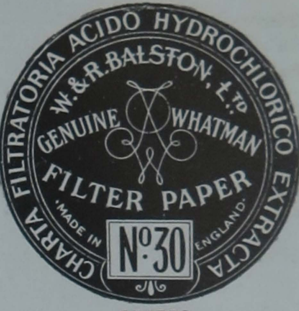
Filter Papers, Continued



154M1



154M4



154M8

Quantity Discounts

On any one order for any assortment of Whatman grades or sizes:

Orders totaling $100.00 list prices	5% discount
Orders totaling $200.00 list prices	10% discount
Orders totaling $500.00 list prices	15% discount

154M1 Filter Papers, Whatman, No. 1. High grade, rapid filtering, for general qualitative work.

Diameter, cm.	**7**	**9**	**11**	**12.5**	**15**	**18.5**	**24**
Ash per circle, grams	.0012	.0019	.0029	.0037	.0053	.0081	....
Package of 100	**$ .20**	**.24**	**.28**	**.36**	**.51**	**.70**	**1.25**

154M2 Filter Papers, Whatman, No. 2. Same as 154M1, except heavier and more retentive. For general qualitative work.

Diameter, cm.	**7**	**9**	**11**	**12.5**	**15**	**18.5**	**24**
Ash per circle, grams	.0013	.0022	.0032	.0041	.0059	.0090	....
Package of 100	**$ .26**	**.34**	**.42**	**.52**	**.74**	**1.05**	**1.75**

154M3 Filter Papers, Whatman ,No. 3. A thick, strong paper, for fine precipitates. Especially resistant to medium concentrations of alkalies.

Diameter, cm.	5.5	7	9	11	12.5	15	18.5
Package of 100	**$ .34**	**.40**	**.50**	**.56**	**.74**	**1.05**	**1.50**

154M4 Filter Papers, Whatman, No. 4. Soft, open texture. Very rapid filtering. Recommended for ferric hydroxide, alumina, insoluble matter and other large particles or gelatinous precipitates.

Diameter, cm.	**7**	**9**	**11**	**12.5**	**15**	**18.5**
Ash per circle, grams	.0013	.0021	.0031	.0041	.0058	.0089
Package of 100	**$ .30**	**.40**	**.50**	**.65**	**.88**	**1.30**

154M5 Filter Papers, Whatman, No. 5. Tough, hard, close texture. Especially suitable for precipitates that are ordinarily filtered with difficulty and when vacuum is employed.

Diameter, cm.	9	11	12.5	15
Package of 100	**$ .34**	**.41**	**.55**	**.77**

154M6 Filter Papers, Whatman, No. 7. Roughened surface, medium texture. Rapid filtering and retentive. For general analysis, but especially recommended for the yellow precipitates of phosphorous determinations. Washes well, and pulps easily for titrations

Diameter, cm.	**7**	**9**	**11**	**12.5**	**15**	**18.5**	**24**
Ash per circle, grams	.00079	.00130	.00195	.00251	.0036	.0055	.0093
Package of 100	**$ .26**	**.34**	**.42**	**.52**	**.74**	**1.05**	**1.75**

154M7 Filter Papers, Whatman, No. 29. Black. For visual estimation of small quantities of light colored precipitates.

Diameter, cm.	5.5	7	9	11
Package of 100	**$ .33**	**.39**	**.50**	**.60**

154M8 Filter Papers, Whatman, No. 30. Washed in hydrochloric acid. Medium texture. Retentive, rapid filtering, low ash weight. Recommended for routine quantitative work.

Diameter, cm.	**5.5**	**7**	**9**	**11**	**12.5**	**15**	**18.5**
Ash per circle, grams	.00008	.00013	.00021	.00031	.00040	.00058	.00088
Package of 100	**$ .50**	**.65**	**.85**	**1.05**	**1.30**	**1.65**	**2.35**

154M9 Filter Papers, Whatman, No. 31. Washed in hydrochloric acid. Open texture, very rapid filtering; low ash weight. Recommended for routine quantitative work for gelatinous precipitates.

Diameter, cm.	**5.5**	**7**	**9**	**11**	**12.5**	**15**	**18.5**
Ash per circle, grams	.00008	.00013	.00022	.00033	.00043	.00062	.00094
Package of 100	**$ .50**	**.65**	**.85**	**1.05**	**1.30**	**1.65**	**2.35**

154M10 Filter Papers, Whatman, No. 32. Washed in hydrochloric acid. Close texture and very retentive; low ash weight. Recommended for routine quantitative work for filtration of very fine precipitates.

Diameter, cm.	**9**	**11**	**12.5**	**15**
Ash per circle, grams	.00021	.00031	.00040	.00058
Package of 100	**$ .85**	**1.05**	**1.30**	**1.65**

Filter Papers, Continued

155M1 Filter Papers, Whatman, No. 40. Washed in hydrochloric and hydrofluoric acids. Medium texture, rapid filtering. General purpose grade for Gravimetric Analysis. Retains all but the finest precipitates.

Diameter, cm.	**5.5**	**7**	**9**	**11**	**12.5**	**15**	**18.5**
Ash per circle, grams	.00003	.00005	.00009	.00013	.00017	.00025	.00038
Package of 100	**$1.00**	**1.05**	**1.50**	**1.75**	**2.05**	**2.35**	**3.20**

155M2 Filter Papers, Whatman, No. 41. Washed in hydrochloric and hydrofluoric acids. Soft, open texture, rapid filtering. For gelatinous and organic precipitates.

Diameter, cm.	**5.5**	**7**	**9**	**11**	**12.5**	**15**	**18.5**
Ash per circle, grams	.0004	.0006	.00010	.00015	.00020	.00028	.00043
Package of 100	**$1.00**	**1.05**	**1.50**	**1.75**	**2.05**	**2.35**	**3.20**

155M3 Filter Papers, Whatman, No. 41H. A thin, rapid filtering paper similar to 155M2, except hardened to give exceptional wet strength. For repeated washing or reprecipitation.

Diameter, cm.	**7**	**9**	**11**	**12.5**	**15**	**18.5**
Ash per circle, grams	.000018	.000030	.000045	.000058	.000083	.000126
Package of 100	**$1.05**	**1.50**	**1.75**	**2.05**	**2.35**	**3.20**

155M4 Filter Papers, Whatman, No. 42. Washed in hydrochloric and hydrofluoric acids. Close texture. Very retentive. For very fine precipitates. Preferably used with vacuum.

Diameter, cm.	**5.5**	**7**	**9**	**11**	**12.5**	**15**	**18.5**
Ash per circle, grams	.00002	.00003	.00005	.00008	.00011	.00016	.00024
Package of 100	**$1.00**	**1.05**	**1.50**	**1.75**	**2.05**	**2.35**	**3.20**

155M5 Filter Papers, Whatman, No. 44. Washed in hydrochloric and hydrofluoric acids. Very thin and retentive with minimum ash weight. Recommended for the most exacting analytical work.

Diameter, cm.	**5.5**	**7**	**9**	**11**	**12.5**	**15**
Ash per circle, grams	.00002	.00003	.00004	.00007	.00010	.00014
Package of 100	**$1.20**	**1.30**	**1.90**	**2.25**	**2.45**	**3.20**

155M6 Filter Papers, Whatman, No. 50. Hardened by treatment with nitric acid. Resists alkalies and dilute acids. Medium weight, very retentive. Especially suited for filtration under vacuum of very fine precipitates and also widely used as Oliensis spot test paper.

Diameter, cm.	**5.5**	**7**	**9**	**11**	**12.5**	**15**	**18.5**
Ash per circle, grams	.000091	.000148	.000244	.000364	.000471	.000678	.00103
Package of 100	**$ .75**	**1.05**	**1.50**	**1.75**	**2.05**	**2.35**	**3.20**

155M7 Filter Papers, Whatman, Folded No. 12. A thick, open texture, rapid filtering paper for coarse precipitates. Used extensively for sugar solutions, oils, etc.

Diameter, cm.	12.5	15	18.5	24	32	38.5	50
Package of 100	**$ .75**	**1.00**	**1.20**	**1.75**	**2.75**	**3.45**	**5.45**

155M8 Filter Papers, Whatman, Folded No. 14. Same as 155M7, except with parchmentized points.

Diameter, cm.	32	38.5	50
Package of 100	**$3.20**	**3.95**	**6.35**

155M9 Filter Paper Tablets, Whatman, Ashless. Washed in hydrochloric and hydrofluoric acids. Useful to expedite filtration of gelatinous precipitates such as iron and aluminum hydroxides, and to improve the filtration of fine precipitates such as barium sulphate, metastannic acid, etc. Tablet weighs about 2.5 grams, with an ash content of approximately .0005 grams.

Box of 100 tablets	**$2.50**

STANDARD
OF PURITY
BAKER & ADAMSON
B&A
QUALITY
REG. U.S. PAT. OFF.

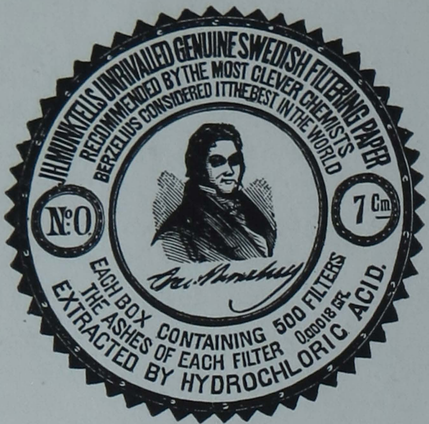
FILTER PAPER
GRADE "A"
WASHED IN
HYDROCHLORIC AND HYDROFLUORIC ACIDS
ASH IN ONE PAPER .000093GRM.
11 cm.
Code BA. 2463

155M10

155M10 Filter Papers, Baker and Adamson Grade A. White, smooth, close texture, double washed in hydrochloric and hydrofluoric acids. Filters rapidly and retains difficult precipitates such as barium sulphate and metastannic acid.

Diameter, cm.	**5.5**	**7**	**9**	**11**	**12.5**	**15**
Ash per circle, grams	.00001	.00002	.00003	.00005	.000065	.000093
Package of 100	**$1.00**	**1.05**	**1.50**	**1.75**	**2.05**	**2.35**

Filter Papers, Continued


J.H. MUNKTELLS UNRIVALLED GENUINE SWEDISH FILTERING PAPER
RECOMMENDED BY THE MOST CLEVER CHEMISTS
BERZELIUS CONSIDERED IT THE BEST IN THE WORLD
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7 Cm
EACH BOX CONTAINING 500 FILTERS
THE ASHES OF EACH FILTER 0,00018 GR.
EXTRACTED BY HYDROCHLORIC ACID.

156M4

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On any one order for any assortment of Munktells grades or sizes:

Orders totaling $100.00 list prices........... 5% discount

Orders totaling $200.00 list prices...........10% discount

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156M1 Filter Papers, Munktells No. 00. Washed in hydrochloric and hydrofluoric acids. Medium weight, medium loose texture, and a smooth finish. Retentive to all common crystalline or gelatinous precipitates, but should not be used for very fine precipitates.

Diameter, cm.	**5.5**	**7**	**9**	**11**	**12.5**	**15**	**18.5**
Ash per circle, grams	.000011	.000018	.000030	.000045	.000058	.000083	.000126
Package of 100	**$1.14**	**1.24**	**1.84**	**2.23**	**2.47**	**2.91**	**4.43**

156M2 Filter Papers. Munktells No. 0A. Washed in hydrochloric and hydrofluoric acids. Medium weight and close texture. Very retentive. Especially suited for filtration of fine precipitates.

Diameter, cm.	**5.5**	**7**	**9**	**11**	**12.5**	**15**	**18.5**
Ash per circle, grams	.000014	.000023	.000038	.000056	.000073	.000104	.000158
Package of 100	**$1.14**	**1.24**	**1.84**	**2.23**	**2.47**	**2.91**	**4.43**

156M3 Filter Papers. Munktells No. 0K. Washed in hydrochloric and hydrofluoric acids. Heavy weight and very retentive. Suitable for vacuum filtration of fine precipitates.

Diameter, cm.	**5.5**	**7**	**9**	**11**	**12.5**	**15**	**18.5**
Ash per circle, grams	.000031	.000050	.000082	.000122	.000158	.000228	.000346
Package of 100	**$ .53**	**.73**	**.93**	**1.15**	**1.54**	**1.79**	**2.36**

156M4 Filter Papers. Munktells No. 0. Washed in hydrochloric acid. Medium weight. Fairly smooth finish. For gelatinous precipitates and fast quantitative work.

Diameter, cm.	**5.5**	**7**	**9**	**11**	**12.5**	**15**	**18.5**
Ash per circle, grams	.00006	.00010	.00017	.00025	.00033	.00046	.00070
Package of 100	**$ .47**	**.63**	**.95**	**1.23**	**1.46**	**1.91**	**2.89**

156M5 Filter papers. Munktells No. 0B. Washed in hydrochloric acid. Same quality as 156M4, except much heavier and stronger. Suitable for vacuum filtration of gelatinous and large grain precipitates.

Diameter, cm.	**5.5**	**7**	**9**	**11**	**12.5**	**15**	**18.5**
Ash per circle, grams	.00008	.00014	.00024	.00035	.00047	.00065	.00100
Package of 100	**$ .49**	**.69**	**1.05**	**1.35**	**1.49**	**2.10**	**3.20**

156M6 Filter Papers. Munktells No. 1F. Light weight, medium soft finish. Will retain fine precipitates, and also is well suited to the separation of organic solids.

Diameter, cm.	**5.5**	**7**	**9**	**11**	**12.5**	**15**	**18.5**
Ash per circle, grams	.00014	.00023	.00038	.00056	.00073	.00105	.00161
Package of 100	**$ .29**	**.36**	**.57**	**.72**	**.96**	**1.19**	**1.73**

156M7 Filter Papers. Munktells No. 2. Same as 156M6, except much faster. Medium soft finish. Medium weight.

Diameter, cm.	**5.5**	**7**	**9**	**11**	**12.5**	**15**	**18.5**
Ash per circle, grams	.00018	.00030	.00051	.00074	.00095	.00138	.00209
Package of 100	**$ .28**	**.35**	**.56**	**.68**	**.85**	**1.12**	**1.47**

156M8 Filter Papers. Munktells No. 3. Medium heavy weight; soft finish; fast filtering. Suitable for vacuum filtration of gelatinous precipitates.

Diameter, cm.	5.5	7	9	11	12.5	15	18.5
Package of 100	**$ .22**	**.25**	**.37**	**.49**	**.66**	**.84**	**1.08**

156M9 Filter Papers. Munktells No. 100. Same as 156M8, except that it is heavier, slightly more retentive, and not so fast. For general qualitative work.

Diameter, cm.	5.5	7	9	11	12.5	15	18.5
Package of 100	**$ .25**	**.30**	**.50**	**.61**	**.78**	**1.01**	**1.33**

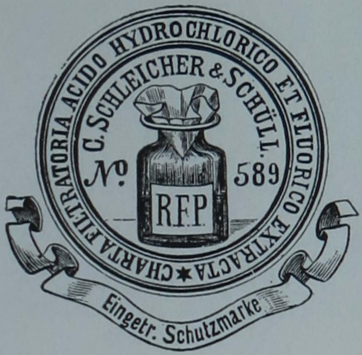
156M10 Filter Papers. Munktells No. 200. Heavy weight, strong, soft finish. Fairly speedy and retentive. Especially suited for laboratories of educational institutions.

Diameter, cm.	9	11	12.5	15	20	25	30
Package of 100	**$ .33**	**.49**	**.64**	**.92**	**1.65**	**2.57**	**3.70**

Filter Papers, Continued

CARL SCHLEICHER & SCHÜLL.
R.F.P.
Eingetr. Schutzmarke

157M1


CHARTA FILTRATORIA ACIDO HYDROCHLORICO ET FLUORICO EXTRACTA
C. SCHLEICHER & SCHÜLL.
№ 589
R.F.P.
Eingetr. Schutzmarke

157M2

Quantity Discounts

On any one order for any assortment of S. & S. grades or sizes:
Orders totaling $100.00 list prices........................ 5% discount
Orders totaling $200.00 list prices........................10% discount
Orders totaling $500.00 list prices........................15% discount

157M1 Filter Papers, S. & S. No. 575. A thin, hardened paper of close texture. Very retentive. Especially adapted for vacuum filtration of fine precipitates.

Diameter, cm.	5.5	7	9	11	12.5	15	18.5
Package of 100	**$ .75**	**1.05**	**1.50**	**1.75**	**2.05**	**2.35**	**3.20**

157M2 Filter Papers, S. & S. No. 589 Black Ribbon. Washed in hydrochloric and hydrofluoric acids. A soft paper of loose texture. Filters very rapidly. For gelatinous and large particle precipitates.

Diameter, cm.	**5.5**	**7**	**9**	**11**	**12.5**	**15**	**18.5**
Ash per circle, grams	.00002	.00003	.00005	.00007	.00009	.00013	.00021
Package of 100	**$1.00**	**1.05**	**1.50**	**1.75**	**2.05**	**2.35**	**3.20**

157M3 Filter Papers, S. & S. No. 589 White Ribbon. Washed in hydrochloric and hydrofluoric acids. Medium texture, retentive and rapid filtering. Suitable for general analytical work.

Diameter, cm.	**5.5**	**7**	**9**	**11**	**12.5**	**15**	**18.5**
Ash per circle, grams	.00002	.00003	.00005	.00007	.00009	.00013	.00021
Package of 100	**$1.00**	**1.05**	**1.50**	**1.75**	**2.05**	**2.35**	**3.20**

157M4 Filter Papers, S. & S. No. 589 Blue Ribbon. Washed in hydrochloric and hydrofluoric acids. Very close and firm in texture. Used for finest precipitates and especially recommended for vacuum filtration.

Diameter, cm.	**5.5**	**7**	**9**	**11**	**12.5**	**15**	**18.5**
Ash per circle, grams	.00002	.00003	.00005	.00007	.00009	.00013	.00021
Package of 100	**$1.00**	**1.05**	**1.50**	**1.75**	**2.05**	**2.35**	**3.20**

157M5 Filter Papers, S. & S. No. 590. Washed in hydrochloric and hydrofluoric acids. A thin and very close textured paper of low ash weight. Retains fine precipitates.

Diameter, cm.	**5.5**	**7**	**9**	**11**	**12.5**	**15**
Ash per circle, grams	.00001	.00002	.00004	.00006	.00008	.00012
Package of 100	**$1.20**	**1.30**	**1.90**	**2.25**	**2.45**	**3.20**

157M6 Filter Papers, S. & S. No. 595. A thin paper with dense texture, very retentive. Particularly suitable for the filtration of aqueous solution, tinctures, spirit and salt solutions. It is free from chlorine.

Diameter, cm.	5.5	7	9	11	12.5	15	18.5
Package of 100	**$ .17**	**.20**	**.24**	**.28**	**.36**	**.51**	**.70**

157M7 Filter Papers, S. & S. No. 597. Pure white filter paper of medium thickness suitable for most analytical work and excellent for filtering extracts and oils.

Diameter, cm.	5.5	7	9	11	12.5	15	18.5	24
Package of 100	**$ .21**	**.26**	**.34**	**.42**	**.52**	**.74**	**1.05**	**1.75**

157M8 Filter Papers, S. & S. No. 597. Square. Same as 157M7, except in square sheets 58x58 cm. **Package** of 100..**$ 8.75**
Ream of 480 sheets..**$39.60**

157M9 Filter Papers, S. & S. No. 598. Thick, soft, rapid filtering and retains fine precipitates. Also used when large quantities of precipitates must be very thoroughly washed.

Diameter, cm.	5.5	7	9	11	12.5	15	18.5
Package of 100	**$ .34**	**.40**	**.50**	**.56**	**.74**	**1.05**	**1.50**

157M10 Filter Papers, S. & S. No. 602. A paper with great density and hardness, especially valuable for the filtration of finest particles or precipitates. Recommended for vacuum filtration.

Diameter, cm.	5.5	7	9	11	12.5	15	18.5
Package of 100	**$ .20**	**.26**	**.34**	**.41**	**.55**	**.77**	**1.10**

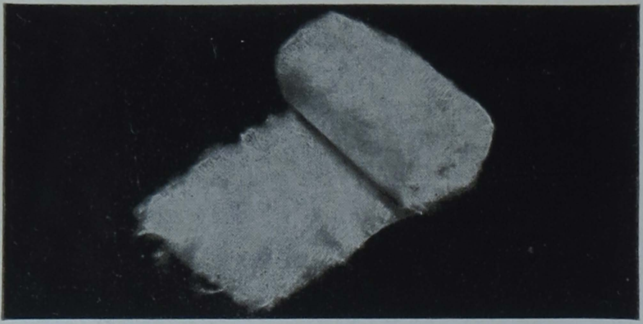
157M11 Filter Papers, S. & S. No. 604. A soft, rapid filtering paper not recommended for fine precipitates.

Diameter, cm.	5.5	7	9	11	12.5	15	18.5
Package of 100	**$ .26**	**.30**	**.40**	**.50**	**.65**	**.88**	**1.30**

157M12 Filter Papers, S. & S. No. 588, Folded. Thick, open textured, soft finish, fast filtering. For coarse precipitates.

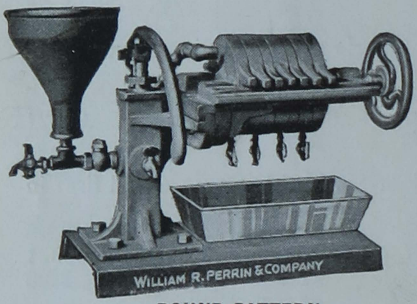
Diameter, cm.	12.5	15	18.5	24	27	32
Package of 100	**$ .75**	**1.00**	**1.20**	**1.75**	**1.95**	**2.75**

Filter Apparatus, Continued


158M1

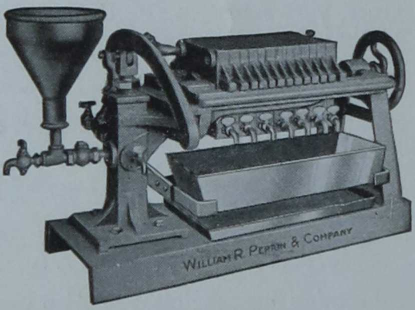
158M1 Filter Glass, Fibrous, Pyrex. High stability. Used as a filtering medium in laboratory work. Lead and borax free. Recommended for use where solubility or pH are critical factors. Its fibre diameters vary between .0002 and .0003 inches. Supplied in sheet form in convenient ½-pound rolls. Sheets are approximately ⅛-inch thick and 10 inches wide. Twelve pounds to a package. ½-pound rolls, **Each** . . **$ 1.10**
Case of 24. . . . . **$23.76**

158M2 Filter Glass, Fibrous, Pyrex. Standard wool. Lead and borax free. Its fibre diameters vary between .0002 and 0003 inches. Supplied in sheet form in convenient ½-pound rolls. Sheets approximately ½-inch thick; 10 inches wide. Twelve pounds to a package. ½-pound rolls, **Each** . **$ .65**
Case of 24. . . . . **$14.04**



ROUND PATTERN
158M3

Filter Presses. Enables the chemical engineer to make practical laboratory tests which give all necessary results for quick, accurate determination of percentages desired in the use of certain materials. Designed with flush type, corrugated surface plates and extension frames so that either cloth or filter paper can be used as filtering medium, and suitable for a working pressure up to 150 pounds per square inch, permitting tests to be made under pressure same as used on large size filter presses. Plates and frames measure 6 inches outside and 5 inches inside. Frames are ⅞ inches wide for holding solids or residuum. The presses consist of head plates, filter plates, extension frames, reservoir, hand pump fitted with brass valves and furnished with brass discharge cocks, pressure gauge, syphon, pan, cotton cloth and filter paper.



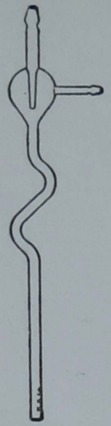
SQUARE PATTERN
158M5

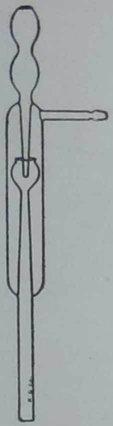
158M3 Filter Presses, Round Pattern, Iron. With two head plates, two filter plates, and three extension frames. Weight, 120 pounds. **Each** **$80.00**

158M4 Filter Presses, Round Pattern, Brass. Otherwise, same as 158M3. Weight, 130 pounds. **Each** **$115.00**

158M5 Filter Presses, Square Pattern, Iron. With two head plates, 5 filter plates, 6 extension frames and 1 dummy plate. Weight, 210 pounds. **Each** **$125.00**

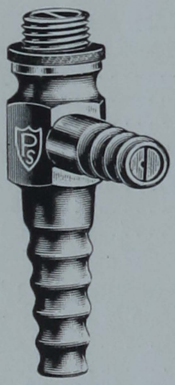
158M6 Filter Presses, Square Pattern, Brass. Otherwise same as 158M5. Weight, 230 pounds. **Each** **$175.00**

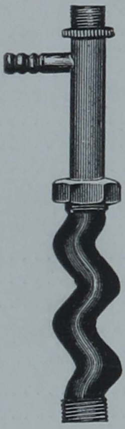

158M7

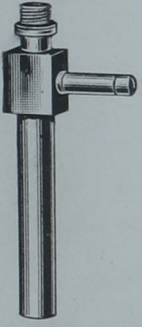

158M8

158M7 Filter Pumps, Glass, Geissler. Each **$1.50**

158M8 Filter Pumps, Glass, Muencke. Each **$1.70**


158M9


158M11


158M13

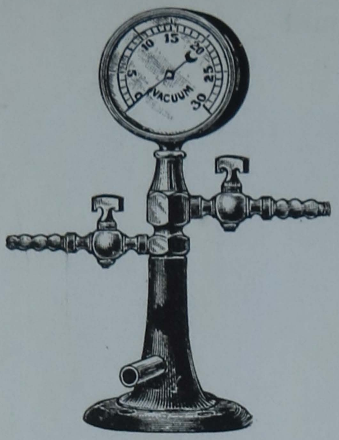
158M9 Filter Pumps. Accurately machined from solid bar, burnished brass. No castings. Hexagonal wrench seat with ⅜-inch iron pipe size tapered male thread to fit faucet couplings or standard laboratory faucets. Will produce a comparatively high vacuum quickly. Can be used for both high and low pressures. Spiral swivel inside neck imparts a swirling motion to the water, encouraging the entrainment of air particles drawn from the vessel being evacuated. Positive-acting valve disc inside the suction tube prevents air or water from backing up when the water is shut off or its pressure is reduced. Suction tube and pump tail serrated to grip rubber tubing. **Each** **$1.25**

158M10 Filter Pumps, Richards. All brass except lead crook. Length, 7 inches, with ⅛-inch I. P. S. thread.
Each **$1.60**

158M11 Filter Pumps, Richards. Rugged; all brass. Equipped with a Z-form tail which causes violent turbulation and mixture of water and entrained air. Air can not re-enter suction tube. Hexagonal wrench seat. Leather washer included. Lower end of Z-tube is threaded to facilitate connection to waste. With ⅜-inch I. P. S. male thread. Length, 6¾ inches. **Each** **$2.25**

158M12 Filter Pumps, Richards. Same as 158M11, except with ¾-inch I. P. S. male thread. Length, 12½ inches.
Each **$6.50**

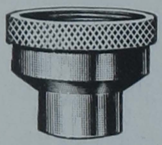
158M13 Filter Pumps, Chapman. Machined from a solid brass rod. With semi-circular baffle in the discharge tube to assist air entrainment, and a valve disc in suction arm to prevent back flow of air. Square wrench seat, and ¼-inch I. P. S. male thread. Length, 4¾ inches. **Each** **$1.30**



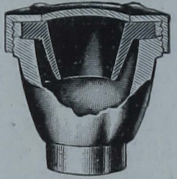
159M1

159M1 Filter Pumps. With gauge and hose connections for water and vacuum. Furnished with stopcocks on the hose connections. **Each** **$10.00**

159M2 Filter Pumps. Same as 159M1, except without stopcocks. **Each** **$9.00**



159M3



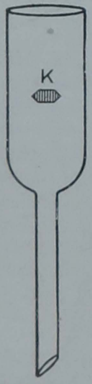
159M4

159M3 Filter Pump Connections. Brass, with leather washer, for threaded faucets. With I. P. S. female thread at bottom for filter pump or hose connection.

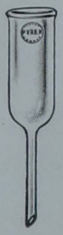
Size, female connection, inches	⅛	¼	⅜	¾
Each	**$ .40**	**.40**	**.40**	**.75**

159M4 Filter Pump Connections. Brass, with rubber adapter compressed by screw cap. For smooth faucets; with I. P. S. female thread at bottom for filter pump or hose connection.

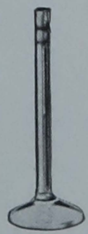
Size, female connection inches	⅛	¼	⅜
Each	**$ .55**	**.55**	**.55**



159M5



159M6



159M7

159M5 Filter Tubes. Slightly flared at top to make a better seat for filtering crucibles.

Diameter, inside top, mm.	**25**	**28**	**33**	**37**	**40**
Length, overall, mm.	150	150	160	160	160
Each	**$ .22**	**.28**	**.32**	**.35**	**.40**

159M6 Filter Tubes, Pyrex.

Diameter, inside top, mm.	**25**	**28**	**32**	**37**
Length, overall, mm.	150	150	160	160
Quantity in case	36	24	24	24
Each	**$ .30**	**.35**	**.40**	**.50**
Case	**$9.72**	**7.56**	**8.64**	**10.80**

159M7 Filter Tubes, Jena, Immersion. For filtering large volumes by immersion in clear liquid after the precipitate has been allowed to settle. Diameter of disc, 30 mm.; height above disc, 180 mm. **Each** **$3.30**

Fire Extinguishers

Pyrene
TO OPERATE

159M8

159M11

Fire Extinguishers, Pyrene. Most effective for smothering all classes of fire in its incipient stage, fires in inflammable liquids or electrical equipment. The liquid is non-conductive and will not injure electrical equipment. The double-acting pump with patented rotating pick-up will discharge a steady continuous stream 25 to 30 feet, no matter in what position the extinguisher is held. The liquid will not freeze at 50° below zero F. The 1-quart and 1½-quart sizes are inspected and labeled by the Underwriters' Laboratories, and approved by Associated Factory Mutual. Complete with wall bracket and fully charged.

Capacity, quarts	½	1	1½
159M8 Polished Brass. Each	**$10.00**	**14.00**	**17.00**
159M9 Chromium Plated. Each	**$12.00**	**16.00**	**19.00**
159M10 Extra Wall Brackets. Each	**$ .75**	**1.00**	**1.50**

159M11 Fire Extinguishers, Pyrene Pressure Type. Of polished copper. The open face pressure gauge at the top indicates the correct air pressure in the chamber at all times. An inspection glass is also provided so that the liquid level may be observed. The normal level is the center of this glass. To operate the extinguisher grasp the hose in right hand and with left hand operate valve wheel which completely controls the flow of air and liquid at a quarter turn. The stream ranges from 30 to 40 feet. Is inspected and labeled by the Underwriters' Laboratories and approved by the Associated Factory Mutual Laboratories. Weight of extinguisher, filled, 32 pounds; shipping weight, 37 pounds; height, overall, 24 inches; diameter of tank, 6 inches. Capacity, one gallon. Complete and fully charged. **Each** **$70.00**

159M12 Fire Extinguishers, Pressure Type. Same as 159M11, except chromium plated. **Each** **$74.00**

Pyrene
FIRE EXTINGUISHING LIQUID

159M13

159M13 Fire Extinguisher Liquid, Pyrene.

Size, can, pints	1	2	3	8
Each	**$ .75**	**1.50**	**2.25**	**5.40**

Fire Extinguishers, Continued

ESSANAY
FOR FIRE

160M1

Fastfome
FOR FIRE

160M4

ACCURATE
FIVE GALLON PUMP TANK
FIRE

160M7

160M1 Fire Extinguishers, Soda and Acid, Essanay. Of polished copper. Used where the cooling and quenching effect of a stream of water is of first importance. Ejects a stream 40 feet in any direction. It should be protected against frost. As a safeguard against corrosion, the interior is completely coated with a lead alloy. Each extinguisher is tested at the factory to withstand a pressure of 350 pounds. It must be recharged immediately after use. Inspected and labeled by Underwriters' Laboratories, and approved by the Factory Mutual Laboratories. Capacity, 2½ gallons; weight, filled, 38 pounds; height, 24 inches. Packed one to a carton; shipping weight, 19 pounds. Complete with charge. **Each**.......................................**$16.50**

160M2 Fire Extinguishers, Soda and Acid, Essanay. Same as 160M1, except nickel-plated. **Each**................**$18.50**

160M3 Extra Charges. For 160M1 and 160M2 extinguishers. **Each**......................................**$ .40**

160M4 Fire Extinguishers, Fastfome. Of polished copper. Smothers fire—particularly fires in oil, gasoline, naphtha, tar, wax, grease, shellac and flammable solvents. Releases 22 gallons of tough, fire-killing foam which spreads over the burning surface—liquid or solid—cuts off the supply of oxygen, and forms a tough air-tight and fire-proof blanket. Inspected and labeled by the Underwriters' Laboratories, approved by the Factory Mutual Laboratories. Capacity, 2½ gallons; weight, filled, 36 pounds; height, 24 inches. Packed one to a carton; shipping weight, 24½ pounds. Must be recharged yearly and protected against frost. Complete with charge. **Each**.......................................**$19.50**

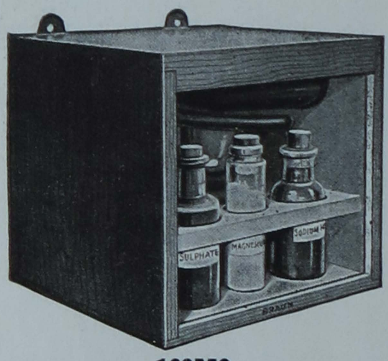
160M5 Fire Extinguishers, Fastfome. Same as 160M4, except nickel-plated. **Each**..............................**$21.50**

160M6 Extra Charges. For 160M4 and 160M5 extinguishers. **Each**......................................**$1.15**

160M7 Fire Extinguishers, Pump Type, Non-Freezing. An approved unit for the protection of heated and unheated property where the hazards are of free-burning materials—wood, rubbish, paper, etc. Can be made non-freezing to 40° F. below zero by using non-freeze charge. Throws a steady, powerful stream 45 feet. Galvanized tank. Interior is coated with a corrosion-resisting composition; the outside is painted red. Inspected and labeled by the Underwriters' Laboratories, and approved by the Associated Factory Mutual Laboratories. Weight of extinguisher, empty, 13 pounds; filled, 54 pounds. Diameter, 9½ inches; length of hose, 24 inches; height overall, 26½ inches; nozzle outlet, ⅛ inch. Packed one to a carton, shipping weight, 16 pounds. Complete with non-freezing charge. **Each**.......................................**$22.00**

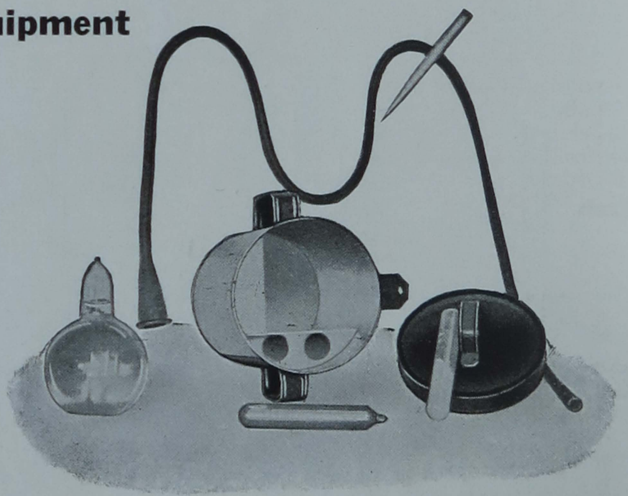
160M8 Non-Freeze Charge. For 160M7 extinguisher. Full charge of 20 pounds will prevent freezing at 40° below zero. In 20-pound cans. **Each**.......................................**$3.00**

First Aid Equipment



160M9

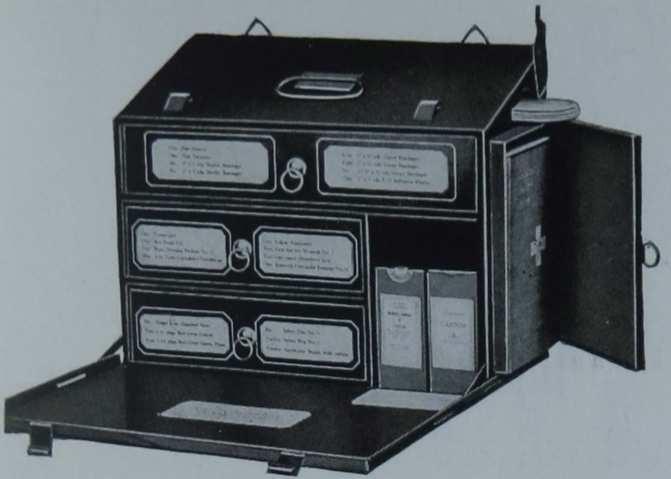
160M9 Cyanide Poisoning Antidote Kits. Arranged according to recommendations of the Committee of the Chemical, Metallurgical and Mining Society of South Africa appointed to investigate cyanide poisoning. Everything required is provided: a gag to open clenched jaws, a good stomach pump, tumbler and spoon and necessary chemicals, ferrous sulphate, caustic potash and powdered oxide of magnesium. Outfit is arranged in a neat air-tight wooden case with glass front. Directions are on the outside of case; an extra set, inside. **Each**.......................................**$8.00**



160M10

160M10 Cyanide Poisoning Antidote Kits. Arranged and approved by the Victorian Mines Department, Australia. Set contains everything necessary for use in case of cyanide poisoning. All chemicals are in hermetically sealed glass containers, which prevents deterioration and insures proper condition when emergency arises. Parts are packed in tin container. Label on outside gives complete directions for use. **Each**.......................................**$7.50**

First Aid Equipment, Continued



161M1

161M1 First Aid Cabinets, Johnson's Number 1. Made of heavy japanned metal with strong hinges, fasteners and hangers. With convenient handles for carrying. Its labeled drawers have ample space for other items, besides its standard contents.

Contents

4 1-yard cartons Absorbent Gauze
2 4-ounce cartons Absorbent Cotton
6 2-inch Cotton Bandages (5 yards)
4 3-inch Cotton Bandages (5 yards)
4 1-inch Gauze Bandages (10 yards)
8 2-inch Gauze Bandages (10 yards)
6 2½-inch Gauze Bandages (10 yards)
1 Esmarch Triangular Bandage
1 1-inch Spool "ZO" Adhesive Plaster (5 yards)
1 First Aid Packet Number 3
4 Picric Acid Gauze Pads, 3½x36 inches
2 1½-ounce Tubes Joncolia
1 box Band-Aid
6 Finger Cots, assorted sizes
1 Tourniquet, buckle type
2 packages of Safety Pins
4 Wooden Splints, 2¾x15¼ inches
1 2-ounce bottle Aromatic Spirits of Ammonia
1 2-ounce bottle Iodine Solution
1 dozen Wooden stick Applicators
1 1-ounce bottle Camphenol
1 8-ounce empty bottle for Camphenol Solution
1 pair Scissors
1 pair Tweezers
1 Johnson's First Aid Manual
10 Accident Blanks
10 Ordering and Inventory Blanks

Each..**$15.00**

BULLARD
CYLINDRICAL
FIRST AID
KIT

161M2

161M2 First Aid Kit, Cylindrical. A compact pocketed canvas roll which fits into a handy dust proof aluminum wall container. Roll is 9x3¼ inches in diameter, contains 12 units and a first aid instruction book.

Contents

1 Unit R1, 4-inch Bandage Compress
2 Unit R2, 2-inch Bandage Compress
1 Unit R3b, 1-inch Adhesive Compress (16 per unit)
1 Unit R5, Ammonia Inhalant (10 per unit)
2 Unit R7, Triangular Bandage
1 Unit R8aR, U. S. Army Tourniquet
1 Unit R47a Mult-Aply Iodine
1 Unit R8S, pair Scissors
1 Unit R8B, pair Tweezers
1 Unit R31K, tube, ½-ounce, Pyrol
1 First Aid Instruction Book
Complete, with roll and wall container.

Each........................**$4.45**

WOOD'S EMERGENCY CASE
Johnson's First Aid for Wounds
BURN DRESSING PACKET
Johnson & Johnson
RED CROSS GAUZE

161M3

161M3 First Aid Kits, Wood's Number 6. Case is ruggedly constructed of twenty-eight gauge metal with hinged cover. Designed for camp, automobile, launch, home or small shop. where a compact and convenient accident outfit is desired. Size, 9x7½x3 inches. Weight, 3 pounds.

Contents

2 1-yard packages Absorbent Gauze
1 1-ounce package Absorbent Cotton
2 2-inch Cotton Bandages (5 yards)
3 2-inch Gauze Bandages (10 yards)
1 1-inch Gauze Bandage (10 yards)
1 First Aid Packet Number 3
1 Burn Dressing Packet Number 22
1 ½-inch Spool "ZO" Adhesive Plaster (5 yards)
1 Tape Tourniquet, buckle type
1 box Band-Aid
1 1½-ounce Tube Joncolia
1 1-ounce bottle Iodine Solution
1 pair Scissors
1 pair Tweezers
1 dozen Safety Pins
1 First Aid Handbook

Each..**$5.50**

"TRAVELKIT"
J & J BAND-AID
FIRST-AID CHART
Bandage Compress

161M4

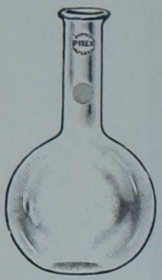
161M4 First Aid Kits, Pocket. Strong, hinged, metal pocket packet cases. Designed for use in all cases in which scattered workmen do not have ready access to first aid cabinets.

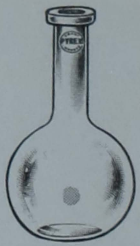
Contents

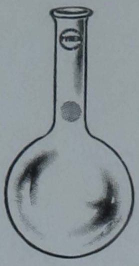
2 1-inch Adhesive Compresses
2 1¼-inch Bandage Compresses
1 3-inch Bandage Compress
1 Antiseptic Swab
1 Ammonia Inhalant
1 Picric Acid Gauze, 12x12 inches
1 1-inch Gauze Bandage (2 yards)
1 3-inch Gauze Bandage (2 yards)

Each..**$ .70**

Flasks


162M1


162M2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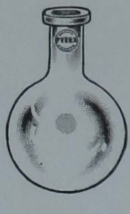
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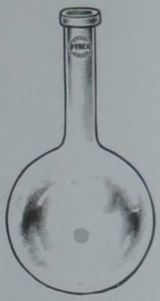

162M5

162M1 Flasks, Boiling, Pyrex, Flat Bottom, Vial Mouth. Also known as Florence flasks.

Capacity, ml.	**50**	**125**	**250**	**300**	**500**	**1000**	**1500**	**2000**	**3000**	**6000**	**12000**	**24000**
Quantity in case	120	120	96	96	72	36	24	18	12	6	4	2
Each	**$ .16**	**.18**	**.21**	**.22**	**.26**	**.39**	**.48**	**.57**	**.76**	**1.60**	**3.30**	**6.60**
Case	**$17.28**	**19.44**	**18.14**	**19.01**	**16.85**	**12.64**	**10.37**	**9.23**	**8.21**	**8.64**	**11.88**	**11.88**

162M2 Flasks, Boiling, Pyrex, Flat Bottom, Ring Neck.

Capacity, ml.	**500**	**1000**	**2000**	**3000**	**6000**	**12000**
Quantity in case	72	36	18	12	6	4
Each	**$ .38**	**.55**	**.78**	**.99**	**1.75**	**3.50**
Case	**$24.62**	**17.82**	**12.64**	**10.69**	**9.45**	**12.60**

162M3 Flasks, Boiling, Pyrex, Round Bottom, Vial Mouth.

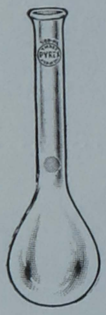
Capacity, ml.	**5***	**10***	**25***	**50**	**100**	**200**	**300**	**500**	**1000**	**2000**	**5000**
Quantity in case	60	60	108	144	84	84	84	48	30	18	6
Each	**$ .20**	**.24**	**.17**	**.17**	**.18**	**.22**	**.28**	**.37**	**.56**	**.79**	**1.50**
Case	**$10.80**	**12.96**	**16.52**	**22.03**	**13.61**	**16.63**	**21.17**	**15.98**	**15.12**	**12.80**	**8.10**

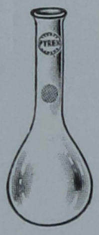
*Suitable for micro-analysis.

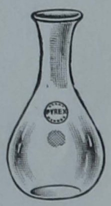
162M4 Flasks, Boiling, Pyrex, Round Bottom, Short Ring Neck.

Capacity, ml.	**200**	**500**	**1000**	**2000**	**3000**	**5000**	**12000**	**22000**	**50000**	**72000**
Quantity in case	96	72	36	18	12	6	4	2	1	1
Each	**$ .28**	**.38**	**.55**	**.78**	**.99**	**1.40**	**3.50**	**7.00**	**16.00**	**25.00**
Case	**$24.19**	**24.62**	**17.82**	**12.64**	**10.69**	**7.56**	**12.60**	**12.60**	**16.00**	**25.00**

162M5 Flasks, Boiling, Pyrex, Round Bottom, Long Ring Neck. Capacity, 12000 ml. **Each, $3.75. Case** of 4....**$13.50**


162M6


162M7


162M8

162M6 Flasks, Kjeldahl, Pyrex, Round Bottom, Long Neck.

Capacity, ml.	**10***	**30***	**100***	**300**	**500**	**650**	**800**
Length, overall, inches	6¾	7	8¼	11¾	12¾	12¾	14⅜
Quantity in case	36	36	36	60	36	36	36
Each	**$ .35**	**.35**	**.32**	**.32**	**.37**	**.42**	**.45**
Case	**$11.34**	**11.34**	**10.37**	**17.28**	**11.99**	**13.61**	**14.58**

*Suitable for micro-analysis.

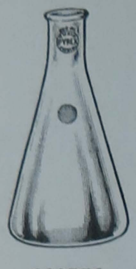
162M7 Flasks, Kjeldahl, Pyrex, Round Bottom, Short Neck.

Capacity, ml.	**300**	**500**	**800**
Length, overall, inches	9⅛	9¾	11
Quantity in case	60	48	36
Each	**$ .32**	**.37**	**.45**
Case	**$17.28**	**15.98**	**14.58**

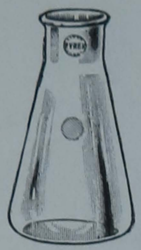
162M8 Flasks, Copper Determination, Pyrex. With flaring neck.

Capacity, ml.	**180**	**250**
Quantity in case	144	108
Each	**$ .25**	**.30**
Case	**$32.40**	**29.16**

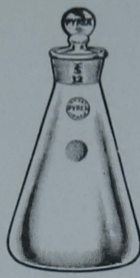
Flasks, Continued



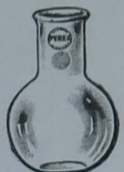
163M1



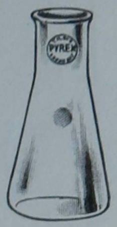
163M2



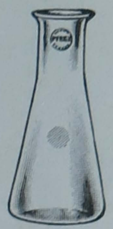
163M3



163M4



163M5



163M6

163M1 Flasks, Erlenmeyer, Pyrex Narrow Mouth.

Capacity, ml.	**10***	**25***	**50***	**125**	**200**	**250**	**300**
Quantity in case	60	120	120	144	144	132	132
Each	**$ .20**	**.18**	**.16**	**.17**	**.19**	**.20**	**.21**
Case	**$10.80**	**19.44**	**17.28**	**22.03**	**24.62**	**23.76**	**24.95**

Capacity, ml., continued	**500**	**750**	**1000**	**1500**	**2000**	**3000**	**4000**	**6000**
Quantity in case	72	48	36	36	24	15	12	6
Each	**$ .25**	**.30**	**.38**	**.48**	**.60**	**.79**	**1.00**	**1.60**
Case	**$16.20**	**12.96**	**12.31**	**15.55**	**12.96**	**10.67**	**10.80**	**8.64**

*Suitable for micro-analysis.

163M2 Flasks, Erlenmeyer, Pyrex, Wide Mouth. Especially recommended as titration flasks.

Capacity, ml.	**250**	**500**	**1000**	**2000**
Quantity in case	132	60	36	24
Each	**$ .20**	**.25**	**.38**	**.60**
Case	**$23.76**	**13.50**	**12.31**	**12.96**

163M3 Flasks, Erlenmeyer, Pyrex, Glass Stoppered. Narrow Mouth.

Capacity, ml.	**10***	**25***	**50***	**125**	**250**	**300**	**500**	**1000**
Quantity in case	24	24	24	24	24	24	18	18
Each	**$ .80**	**.85**	**.90**	**1.00**	**1.15**	**1.30**	**1.50**	**1.80**
Case	**$17.28**	**18.36**	**19.44**	**21.60**	**24.84**	**28.08**	**24.30**	**29.16**

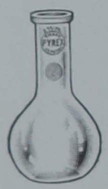
*Smaller sizes are satisfactory for use as weighing bottles and are also suitable for micro-analysis.

163M4 Flasks, Extraction, Pyrex. Flat Bottom, Wide Neck, Vial Mouth.

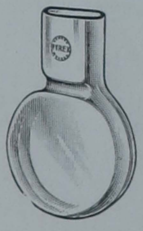
Capacity, ml.	**50**	**100**	**150**	**250**	**500**	**1000**
Quantity in case	144	120	108	120	60	36
Each	**$ .15**	**.16**	**.17**	**.18**	**.25**	**.50**
Case	**$19.44**	**17.28**	**16.52**	**19.44**	**13.50**	**16.20**

163M5 Flasks, Rubber Extraction, Pyrex. A. S. T. M. D-15-T, D-296, D-297, D-231 and D-147. Capacity, 400 ml. **Each, $ .30. Case** of 72 .... **$19.44**

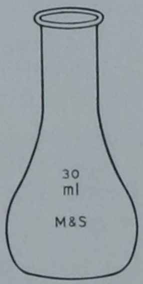
163M6 Flasks, Rubber Extraction, Pyrex Underwriters. Capacity, 250 ml. **Each, $ .28. Case** of 96 .... **$24.19**



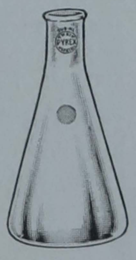
163M7



163M8



163M9



163M10

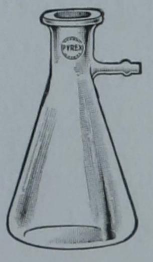
163M7 Flasks, Sulphur, Pyrex, Johnson's. Flat bottom and heavy ring neck. Capacity, 275 ml. **Each, $ .30. Case** of 108 .... **$29.16**

163M8 Flasks, Culture, Pyrex, Kolle. With neck indentation. Capacity, 320 ml. **Each, $ .70. Case** of 48 .. **$30.24**

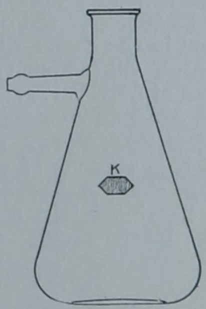
163M9 Flasks, Parting, Colorado Form.

Capacity, ml.	15	30	60
Each	**$ .13**	**.18**	**.60**

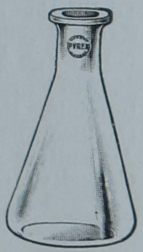
163M10 Flasks, Parting, Erlenmeyer Form, Pyrex. Capacity, 25 ml. **Each, $ .18. Case** of 120 .... **$19.44**



163M11



163M12



163M13

163M11 Flasks, Filtering, Pyrex, Heavy Wall, With Tubulature.

Capacity, ml.	**250**	**500**	**1000**	**2000**	**4000**
Quantity in case	36	24	18	12	6
Each	**$ .70**	**.95**	**1.45**	**2.40**	**4.00**
Case	**$22.68**	**20.52**	**23.49**	**25.92**	**21.60**

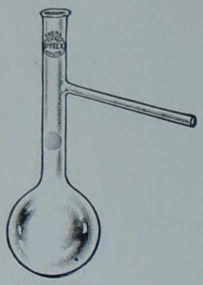
163M12 Flasks, Filtering, With Tubulature.

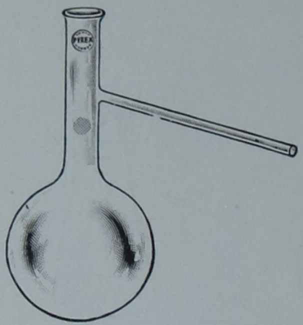
Capacity, ml.	**250**	**500**	**1000**	**2000**	**4000**
Quantity in case	60	36	24	18	6
Each	**$ .50**	**.60**	**.80**	**1.25**	**2.25**
Case	**$27.00**	**19.44**	**17.28**	**20.25**	**12.15**

163M13 Flasks, Filtering, Pyrex, Heavy Wall, Without Tubulature.

Capacity, ml.	**250**	**500**	**1000**	**2000**	**4000**
Quantity in case	72	48	24	18	9
Each	**$ .40**	**.54**	**.84**	**1.20**	**2.00**
Case	**$25.92**	**23.33**	**18.14**	**19.44**	**16.20**

Flasks, Continued


164M1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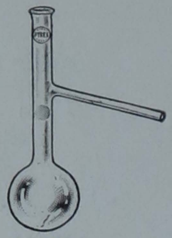
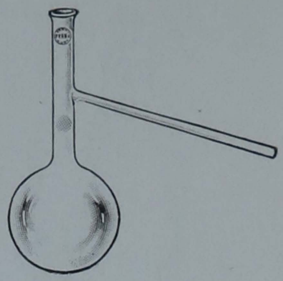
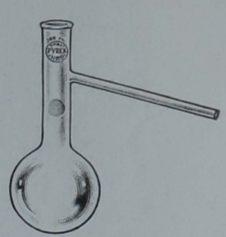
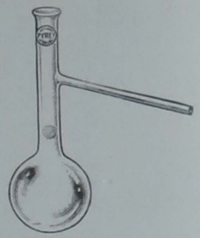

164M3


164M4


164M5


164M6

164M1 Flasks, Distilling, Pyrex. Side tubulature is placed 77 mm. below top of neck.

Capacity, ml.	**25***	**50***	**125**	**200**	**250**	**500**	**1000**	**2000**	**3000**
Quantity in case	24	24	24	36	24	18	12	6	6
Each	**$ .30**	**.35**	**.39**	**.44**	**.48**	**.57**	**.95**	**1.40**	**1.95**
Case	**$6.48**	**7.56**	**8.42**	**14.26**	**10.37**	**9.23**	**10.26**	**7.56**	**10.53**

*Suitable for micro-analysis.

164M2 Flasks, Distilling, Pyrex. With side tubulature in the center of the neck.

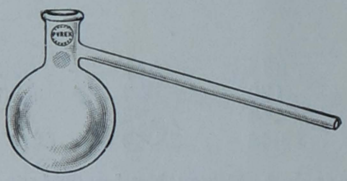
Capacity, ml.	2000	3000	5000
Each	**$1.40**	**1.95**	**3.00**
Case of 6	**$7.56**	**10.53**	**16.20**

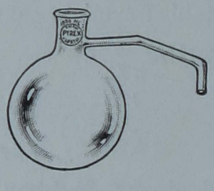
164M3 Flasks, Distilling, Pyrex, Engler. A. S. T. M. D-86. Used in the distillation of gasoline, naphtha, kerosene and similar petroleum products. Capacity, 100 ml. **Each, $ .50. Case** of 48 . . . . **$21.60**

164M4 Flasks, Distilling, Pyrex, Saybolt. A. S. T. M. D-158. For use in the distillation of gas oils. Capacity, 250 ml. **Each, $ .55. Case** of 36 . . . . **$17.82**

164M5 Flasks, Distilling, Pyrex, Barrett. Used in the grading of benzol distilled from coal tar. Capacity, 200 ml. **Each, $ .45. Case** of 48 . . . . **$19.44**

164M6 Flasks, Distilling, Pyrex, Cadillac. For testing the volatility of automobile engine lubricating oil. Capacity, 250 ml. **Each, $ .50. Case** of 24 . . . . **$10.80**

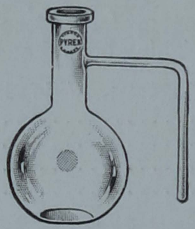

164M7

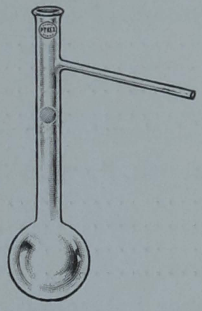

164M8

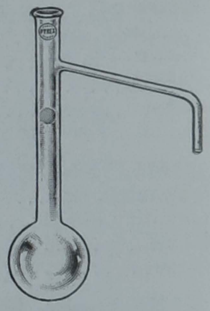
164M7 Flasks, Distilling, Pyrex, Church. A. S. T. M. D-20, D-246 and D-402. For the distillation of bituminous materials. Also used in the Standard Method of Test for the Distillation of Creosote Oil. Capacity, 300 ml. **Each, $ .75. Case** of 24 . . . . **$16.20**

Note: For A. S. T. M. condenser tube, see page 109.

164M8 Flasks, Distilling, Pyrex, Moisture Test. For determining the moisture content of whole grain according to the Brown-Duvel method. Reference: U. S. Department of Agriculture Grain Testing Division, Bulletin Number 1375. Capacity, 1000 ml. **Each, $1.20. Case** of 24 . . . . . . **$25.92**


164M9

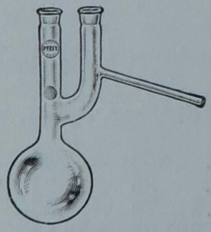

164M10

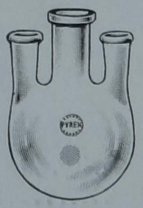

164M11

164M9 Flasks, Distilling, Pyrex, Sulphur Determination. With heavy ring neck and tubulature bent downward. Capacity, 500 ml. **Each, $ .65. Case** of 36 . . . . **$21.06**

164M10 Flasks, Distilling, Pyrex, Hempel. A. S. T. M. D-285. For the distillation of crude petroleum. Capacity, 500 ml. **Each, $ .95. Case** of 12 . . . . **$10.26**

164M11 Flasks, Distilling, Pyrex, Hempel. With side tube bent downward. Bureau of Mines Type. Capacity, 500 ml. **Each, $1.00. Case** of 12 . . . . **$10.80**


164M12


164M13

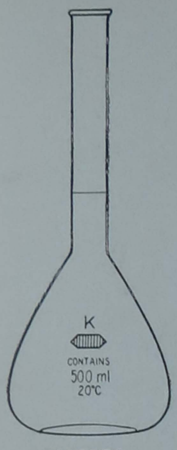
164M12 Flasks, Distilling, Pyrex, Claisen.

Capacity, ml.	**50**	**125**	**250**	**500**	**1000**	**2000**
Quantity in case	36	24	18	12	12	6
Each	**$ .95**	**1.25**	**1.45**	**1.75**	**2.50**	**3.75**
Case	**$30.78**	**27.00**	**23.49**	**18.90**	**27.00**	**20.25**

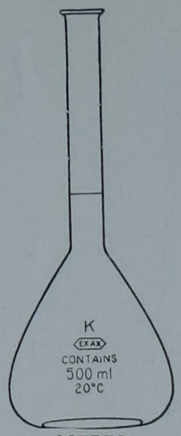
164M13 Flasks, Distilling, Pyrex, Three Necks. Of particular advantage for use with stirring devices. Center neck is approximately twice the diameter of the side necks.

Capacity, ml.	**500**	**1000**	**2000**	**3000**	**5000**	**12000**
Quantity in case	12	12	6	6	6	2
Each	**$ 2.10**	**3.45**	**4.30**	**5.25**	**6.50**	**11.00**
Case	**$22.68**	**37.26**	**23.22**	**28.35**	**35.10**	**19.80**

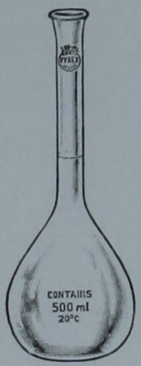
Flasks, Continued



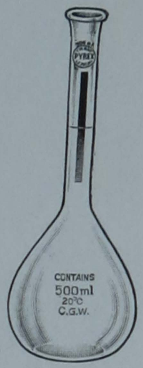
165M1



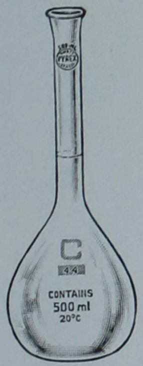
165M2



165M5



165M6



165M7

165M1 Flasks, Volumetric. Without Stoppers. Graduated to contain.

Capacity, ml.	**25**	**50**	**100**	**200**	**250**	**500**	**1000**	**2000**
Quantity in case	36	36	48	36	36	36	24	12
Each	**$ .30**	**.30**	**.30**	**.35**	**.40**	**.50**	**.70**	**.85**
Case	**$9.72**	**9.72**	**12.96**	**11.34**	**12.96**	**16.20**	**15.12**	**9.18**

165M2 Flasks, Volumetric, Exax Blue Line. Without Stoppers. Graduated to contain.

Capacity, ml.	**10**	**25**	**50**	**100**	**200**	**250**	**500**	**1000**	**2000**
Quantity in case	24	24	36	48	36	36	36	24	12
Each	**$ .40**	**.40**	**.40**	**.45**	**.55**	**.60**	**.70**	**1.00**	**1.50**
Dozen	**$4.32**	**4.32**	**4.32**	**4.86**	**5.94**	**6.48**	**7.56**	**10.80**	.....
Case	**$7.68**	**7.68**	**11.52**	**17.28**	**15.84**	**17.28**	**20.16**	**19.20**	**14.40**

165M3 Flasks, Volumetric, Normax, Precision. Without Stoppers. Graduated to contain. Same as 165M2, except all flasks are retested, and will be found to be accurate within the tolerances specified by the National Bureau of Standards in Circular Number 9, "Testing of Glass Volumetric Apparatus."

Capacity, ml.	**25**	**50**	**100**	**200**	**250**	**500**	**1000**	**2000**
Tolerance, ml.	± .03	.05	.08	.10	.12	.15	.30	.50
Quantity in case	12	12	12	12	12	12	6	3
Each	**$ .70**	**.70**	**.75**	**.85**	**.90**	**1.30**	**1.60**	**2.10**
Case	**$6.72**	**6.72**	**7.20**	**8.16**	**8.64**	**12.48**	**7.68**	**5.04**

165M4 Flasks, Volumetric, Normax, Bureau of Standards. Same as 165M3, except certified by the National Bureau of Standards.

Capacity, ml.	**25**	**50**	**100**	**200**	**250**	**500**	**1000**	**2000**
Tolerance, ml.	± .03	.05	.08	.10	.12	.15	.30	.50
Quantity in case	12	12	12	12	12	12	6	3
Each	**$1.30**	**1.30**	**1.35**	**1.45**	**1.50**	**2.30**	**2.60**	**3.10**

165M5 Flasks, Volumetric, Pyrex. Without Stoppers. Graduated to contain.

Capacity, ml.	**10***	**25***	**50***	**100**	**200**	**250**	**500**	**1000**	**2000**
Quantity in case	18	18	12	24	24	24	12	12	12
Each	**$ .80**	**.85**	**.90**	**1.00**	**1.15**	**1.25**	**1.50**	**2.00**	**2.50**
Case	**$12.96**	**13.77**	**9.72**	**21.60**	**24.84**	**27.00**	**16.20**	**21.60**	**27.00**

*Suitable for micro-analysis.

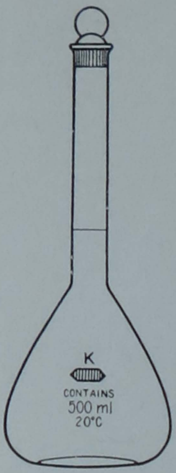
165M6 Flasks, Volumetric, Pyrex Lifetime Red. Without Stoppers. Graduated to contain, with graduation etched thru permanent red stripe.

Capacity, ml.	**100**	**200**	**250**	**500**	**1000**	**2000**
Quantity in case	24	24	24	12	12	12
Each	**$ 1.00**	**1.15**	**1.25**	**1.50**	**2.00**	**2.50**
Case	**$21.60**	**24.84**	**27.00**	**16.20**	**21.60**	**27.00**

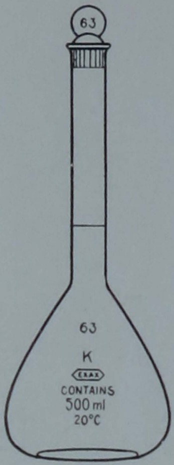
165M7 Flasks, Volumetric, Pyrex Certified. Without Stoppers. Graduated to contain, with graduations guaranteed to be within the tolerances set by the National Bureau of Standards.

Capacity, ml.	**25**	**50**	**100**	**200**	**250**	**500**	**1000**	**2000**
Quantity in case	12	12	12	12	12	12	6	6
Each	**$ 1.15**	**1.25**	**1.35**	**1.50**	**1.60**	**2.15**	**2.65**	**3.15**
Case	**$12.42**	**13.50**	**14.58**	**16.20**	**17.28**	**23.22**	**14.31**	**17.01**

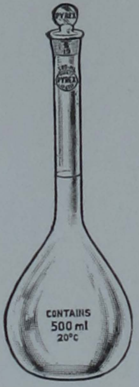
Flasks, Continued



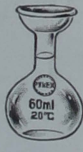
166M1



166M2



166M5



166M7

166M1 Flasks, Volumetric, Glass Stoppered. Graduated to contain.

Capacity, ml.	**25**	**50**	**100**	**200**	**250**	**500**	**1000**	**2000**
Quantity in case	36	36	48	36	36	36	24	12
Each	**$ .45**	**.50**	**.50**	**.55**	**.60**	**.75**	**1.00**	**1.25**
Case	**$14.58**	**16.20**	**21.60**	**17.82**	**19.44**	**24.30**	**21.60**	**13.50**

166M2 Flasks, Volumetric, Exax Blue Line, Glass Stoppered. Graduated to contain.

Capacity, ml.	**10**	**25**	**50**	**100**	**200**	**250**	**500**	**1000**	**2000**
Quantity in case	24	24	36	48	36	36	36	24	12
Each	**$ .55**	**.60**	**.65**	**.70**	**.80**	**.90**	**1.10**	**1.40**	**2.00**
Dozen	**$ 5.94**	**6.48**	**7.02**	**7.56**	**8.64**	**9.72**	**11.88**	**15.12**	.....
Case	**$10.56**	**11.52**	**18.72**	**26.88**	**23.04**	**25.92**	**31.68**	**26.88**	**19.20**

166M3 Flasks, Volumetric, Normax, Precision. Glass Stoppered. Same as 166M2, except retested, and are accurate within the tolerances specified by the National Bureau of Standards in Circular Number 9, "Testing of Glass Volumetric Apparatus."

Capacity, ml.	**25**	**50**	**100**	**200**	**250**	**500**	**1000**	**2000**
Tolerance, ml.	± .03	.05	.08	.10	.12	.15	.30	.50
Quantity in case	12	12	12	12	12	12	6	3
Each	**$ .90**	**.95**	**1.00**	**1.10**	**1.20**	**1.70**	**2.00**	**2.60**
Case	**$ 8.64**	**9.12**	**9.60**	**10.56**	**11.52**	**16.32**	**9.60**	**6.24**

166M4 Flasks, Volumetric, Normax, Precision. N. B. S. Same as 166M3, except certified by the National Bureau of Standards.

Capacity, ml.	**25**	**50**	**100**	**200**	**250**	**500**	**1000**	**2000**
Tolerance, ml.	± .03	.05	.08	.10	.12	.15	.30	.50
Quantity in case	12	12	12	12	12	12	6	3
Each	**$ 1.50**	**1.55**	**1.60**	**1.70**	**1.80**	**2.70**	**3.00**	**3.60**

166M5 Flasks, Volumetric, Pyrex, Ŧ Glass Stoppered. Graduated to contain.

Capacity, ml.	**10***	**25***	**50**	**100**	**200**	**250**	**500**	**1000**	**2000**
Quantity in case	12	12	12	18	12	12	12	12	6
Each	**$ 1.20**	**1.30**	**1.40**	**1.50**	**1.75**	**1.85**	**2.35**	**2.85**	**3.50**
Case	**$12.96**	**14.04**	**15.12**	**24.30**	**18.90**	**19.98**	**25.38**	**30.78**	**18.90**

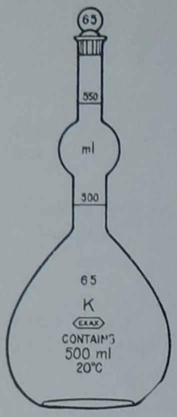
*Suitable for micro-analysis.

166M6 Flasks, Volumetric, Pyrex Certified, Glass Stoppered. Graduated to contain, with graduations guaranteed to be within the tolerances set by the National Bureau of Standards.

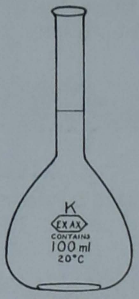
Capacity, ml.	**25**	**50**	**100**	**200**	**250**	**500**	**1000**	**2000**
Quantity in case	12	12	12	12	12	12	6	6
Each	**$ 1.65**	**1.75**	**1.85**	**2.10**	**2.20**	**2.85**	**3.50**	**4.15**
Case	**$17.82**	**18.90**	**19.98**	**22.68**	**23.76**	**30.78**	**18.90**	**22.41**

166M7 Flasks, Volumetric, Pyrex, Viscosimeter. A. S. T. M. D-88. Rim is reinforced by beading of glass. Used in standard methods of test for viscosity of petroleum products and lubricants. Capacity, 60 ml. **Each, $ .90.** **Case** of 24........**$19.44**

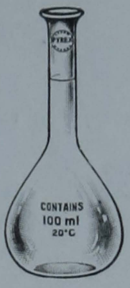
Flasks, Continued



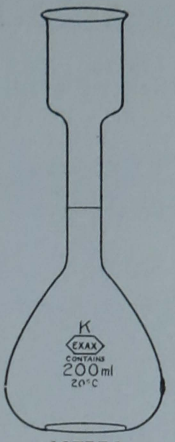
167M1



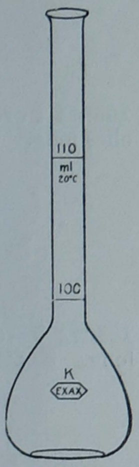
167M2



167M3



167M4



167M6

167M1 Flasks, Volumetric, Exax Blue Line, Giles, Glass Stoppered. With two graduations. For making normal solutions. The 10% extra capacity in the neck is used for titration leaving the full nominal volume for adjustment of the normality of the solution.

Capacity, ml.	**500–550**	**1000–1100**	**2000–2200**
Quantity in case	18	12	6
Each	**$2.00**	**3.00**	**4.00**
Dozen	**$21.60**	.....	.....
Case	**$28.80**	**28.80**	**19.20**

167M2 Flasks, Volumetric, Exax Blue Line, Bates Sugar. The 100 ml. flask is the standard U. S. Customs Service size.

Capacity, ml.	**100**	**200**
Tolerance, ml.	± .08	.10
Quantity in case	48	24
Each	**$ .60**	**.85**
Dozen	**$ 6.48**	**9.18**
Case	**$23.04**	**16.32**

167M3 Flasks, Pyrex, Bates Sugar. With short neck and slightly flaring top. For the preparation of sugar solutions for polarization test. Capacity, 100 ml. **Each, $ .65. Case** of 24 .... **$14.04**

167M4 Flasks, Volumetric, Exax Blue Line, Kohlrausch. With enlarged mouth, providing for easy introduction of samples of solid material.

Capacity, ml.	**100**	**200**	**201**	**500**
Tolerance, ml.	± .10	.15	.15	.30
Quantity in case	48	24	24	12
Each	**$ .70**	**1.00**	**1.00**	**1.50**
Dozen	**$ 7.56**	**10.80**	**10.80**	.....
Case	**$26.88**	**19.20**	**19.20**	**14.40**

167M5 Flasks, Volumetric, Kohlrausch, Ungraduated. Similar to 167M4, except without graduations. Designed so that when graduated in the laboratory the mark will fall at the proper point on the neck.

Capacity, ml.	100	200	201	300	500
Each	**$ .50**	**.75**	**.75**	**1.00**	**1.35**

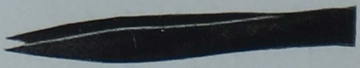
167M6 Flasks, Volumetric, Exax Blue Line, Sugar. With two graduations providing for 1/10 dilution.

Capacity, ml.	**50–55**	**100–110**	**200–220**
Tolerance, ml.	± .05	.08	.10
Quantity in case	36	48	24
Each	**$ .70**	**.80**	**.90**
Dozen	**$ 7.56**	**8.64**	**9.72**
Case	**$20.16**	**30.72**	**17.28**

167M7 Flasks, Dewar, Short Neck. Evacuated and silvered.

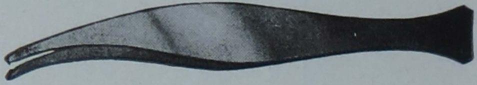
Capacity, pints	**1**	**2**
Diameter, outside, inches	$3\frac{15}{16}$	$4\frac{3}{4}$
Diameter, inside, inches	$3\frac{9}{16}$	$4\frac{7}{16}$
Diameter, inside, neck, inches	$1\frac{5}{8}$	$1\frac{5}{8}$
Length, neck, inches	$1\frac{1}{8}$	$1\frac{1}{8}$
Length, total, inches	$5\frac{5}{8}$	$6\frac{3}{4}$
Depth, inside, inches	$5\frac{3}{16}$	$6\frac{3}{8}$
Each	**$3.25**	**4.00**

Forceps



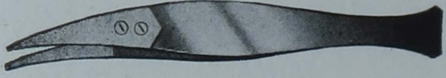
168M1

168M1 Forceps, Brass, Nickel Plated, Straight. 3¼ inches long. **Each** .... **$ .20**



168M2

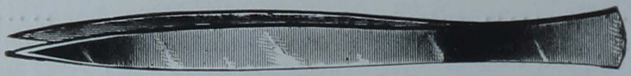
168M2 Forceps, Brass, Nickel Plated, Curved. 4 inches long. **Each** **$1.25**



168M3

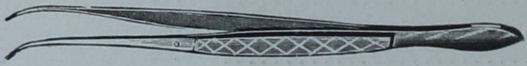
168M3 Forceps, Ivory Tip, Curved. Of brass, nickel plated. 4 inches long. **Each** .... **$ .75**

168M4 Forceps, Ivory Tip, Straight. Same as 168M3, except straight. 4 inches long. **Each** .... **$ .75**



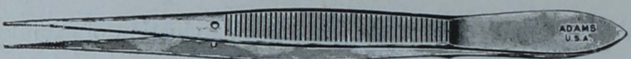
168M5

168M5 Forceps, Brass, Straight. Non-magnetic with sharp, fine points. 4¼ inches long. **Each** .... **$ .18**



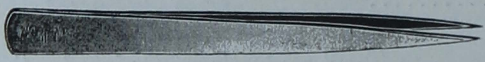
168M6

168M6 Forceps, Steel, Nickel Plated, Curved. With fine serrated points. 5 inches long. **Each** .... **$ .55**



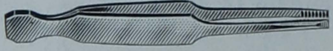
168M7

168M7 Forceps, Steel, Nickel Plated, Straight. With fine serrated points. 4½ inches long. **Each** .... **$ .40**



168M8

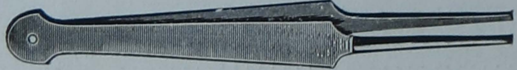
168M8 Forceps, Steel, Nickel Plated, Straight. With fine, long beveled, smooth points. 4¾ inches long. **Each** .. **$ .18**



168M9

168M9 Forceps, Heavy Steel, Straight. With blunt serrated points. Student grade.

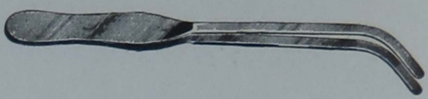
Length, inches	4	5	6
Each	**$ .10**	**.12**	**.15**



168M10

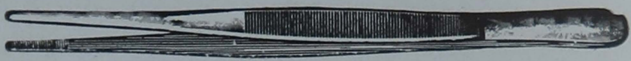
168M10 Forceps, Steel, Slag. For holding lead buttons.

Length, inches	6	7
Each	**$ .35**	**.55**



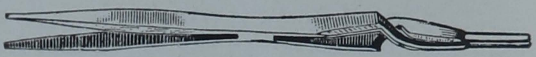
168M11

168M11 Forceps, Monel Metal, Goose-Neck. With blunt serrated points. 6 inches long. **Each** .... **$ .65**



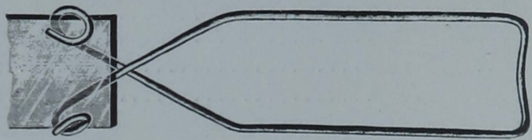
168M12

168M12 Forceps, Steel, Nickel Plated. Long, Heavy Pattern. With serrated points. 10 inches long. **Each** **$2.00**



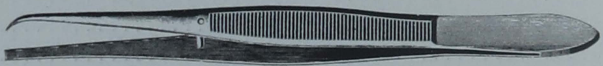
168M13

168M13 Forceps, Double, With Platinum Tips. Double French form. One end self-closing; the other end self-opening. 135 mm. long. **Each** **$6.00**



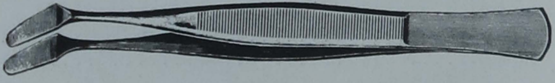
168M14

168M14 Forceps, Slide. For holding microscope slides. 4 inches long. **Each** .... **$ .15**



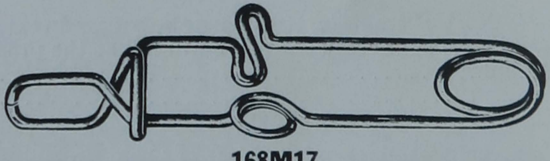
168M15

168M15 Forceps, Cover Glass. With curved pointed upper blade and flat lower blade. Nickel plated. 4½ inches long. **Each** .... **$ .65**



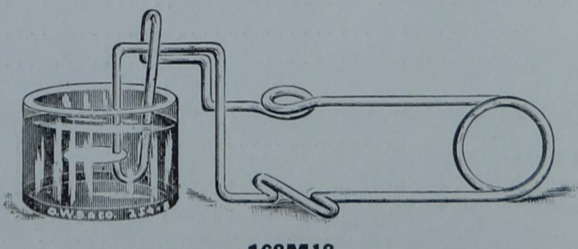
168M16

168M16 Forceps, Cover Glass. Flat, corrugated handles with flat, thin blades. Nickel plated steel. 4½ inches long. **Each** .... **$ .85**



168M17

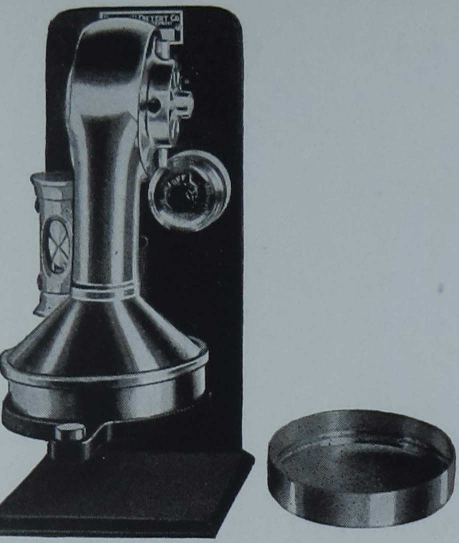
168M17 Forceps, Cover Glass, Stewart, Self-Closing. Made of one piece steel wire, nickel plated. 4½ inches long. **Each** .... **$ .15**



168M18

168M18 Forceps, Cover Glass, Dr. Kalteyer's. Made of nickel. 4 inches long. **Each** .... **$ .20**

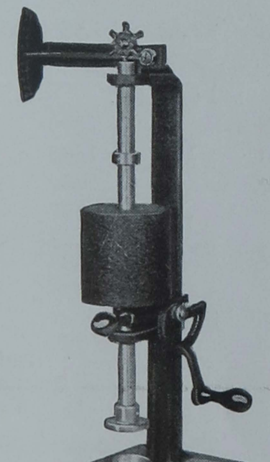
Foundry Sand Testing and Control Equipment



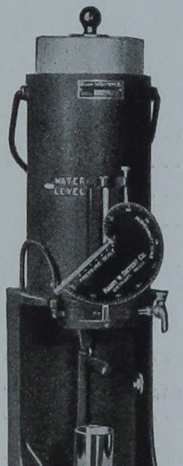
169M1

169M1 Moisture Tellers. For quick, accurate moisture test of foundry sands. Will dry a 50-gram molding sand sample in 45 seconds. Moisture test is made in exact moisture percentage and test results check exactly with the standard oven test. Height, 14.5 inches; base, 6x11 inches. Shipping weight, 14 pounds. Current, 110 volts, 600 watts, A. C. or D. C. Complete with motor, 3 sand drying pans 1 inch deep, counterweight, scoop and crucible tongs. **Each**.............**$48.00**

169M2 Moisture Tellers. Same as 169M1, except for 220 volts, A. C. or D. C. **Each**.......................**$50.00**



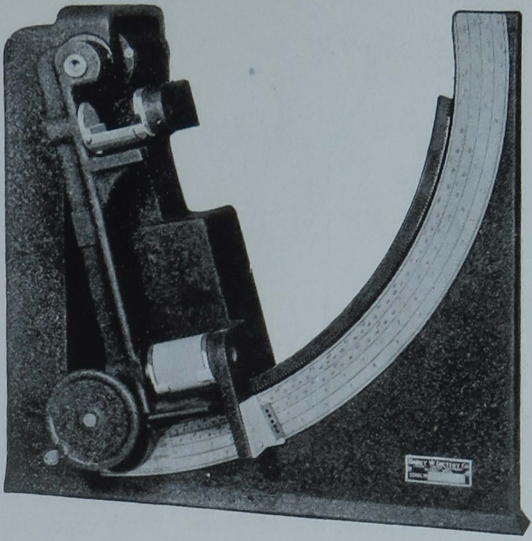
169M3



169M4

169M3 Sand Rammers. For ramming the A. F. A. standard sand specimen. Ramming weight hardened to prevent rapid wear. Plunger head tapered to prevent binding and hardened to withstand cutting by the sand. Mechanical weight raising device speeds up ramming operation. Handle provided to lift plunger when inserting specimen. Cup pedestal for specimen tube places sand specimen at end of tube. Height of sand rammer, 25 inches; base, 9x12 inches. Shipping weight, 60 pounds. Complete with hardened steel specimen tube and 2 pedestals. **Each**..................................**$32.00**

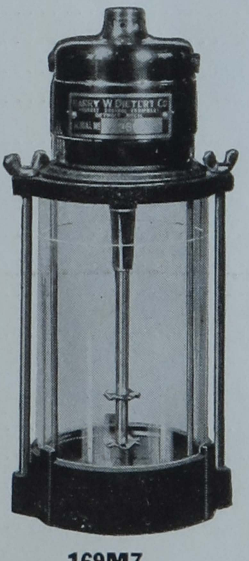
169M4 Permeability Meters. For measuring green A. F. A. permeability of molding sands, core sands, cores and molds. Permeability is read direct for the A. F. A. orifice test method on the curved portion of dial, and the straight scale is used for A. F. A. Stop Watch Research Method. Capacity on dial, 0 to 900 permeability. Height, 28 inches; base, 10x10 inches Shipping weight, 36 pounds. **Each**................**$72.00**



169M5

169M5 Sand Strength Machines. For measuring the green and dry bond strength of molding sands, cores, core pastes, and clays. Ideal for testing the molding sand by the A. F. A. Standard Compression Test for both green and dry sand, for green and dry shear, and tensile. Core strength accessories are available. Machine may be hand operated or motor driven. Height, 20 inches; base, 20x8 inches. Shipping weight, 210 pounds. Equipped for green and dry compression test of molding sand only. **Each**.......................**$120.00**

169M6 Motor Drives. For 169M5 sand strength machine. Consists of an electric motor containing reduction gears, control switch and an automatic reversing switch. Easily attached to pusher arm of strength machine. Will load specimen uniformly; reverses when specimen breaks; returns pusher arm to zero position. Shipping weight, 30 pounds. Current consumption, 110 or 220 volts, 50 watts. **Each**......**$58.00**

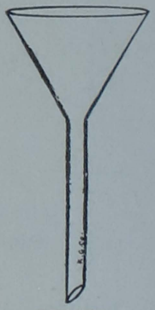


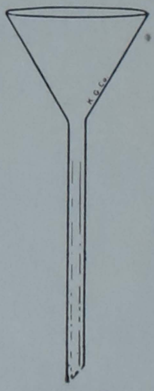
169M7

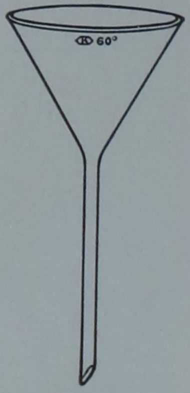
169M7 Sand‸Washers for Clay. For rapid percentage clay substance determinations. Tentative A. F. A. specifications. Consists of an aluminum frame, 110 or 220 volt Universal electric motor, wash bottle, syphon tube, and sand glass to time operation. Unit furnishes a practical means of scrubbing the clay from the sand grains in accordance with A. F. A. Fineness Test. The wash bottle is made up of a clamping ring, a glass cylinder and a brass cup in which the sand grains remain after completion of the syphoning operation. The sand grains are dried in this cup, thus eliminating transferring procedure and filtering. **Each**....................**$35.00**

For fineness test equipment, see page 346 for sieve shakers.

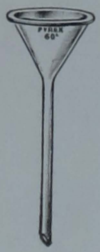
Funnels


170M1

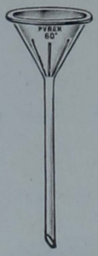

170M2



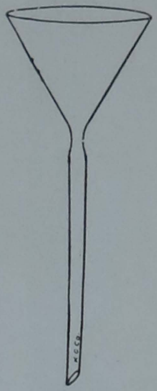
170M3

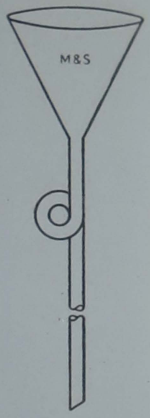


170M4



170M5


170M6



170M7

170M1 Funnels, Glass, Short Stem. Bowl approximately 60° angle with ground rim and stem ground to point.

Diameter, mm.	**40**	**50**	**65**	**75**	**90**	**100**	**125**	**150**	**200**	**250**	**300**
Length, stem, mm	50	60	65	75	90	100	125	150	150	150	150
Quantity in case	72	72	72	72	48	48	36	24	18	12	12
Each	**$ .20**	**.22**	**.24**	**.28**	**.32**	**.36**	**.48**	**.60**	**.95**	**1.80**	**2.40**
Case	**$12.96**	**14.26**	**15.55**	**18.14**	**13.82**	**15.55**	**15.55**	**12.96**	**15.39**	**19.44**	**25.92**

170M2 Funnels, Glass, Long Stem. Bowl approximately 60° angle with ground rim. Stem ground to point.

Diameter, mm.	**40**	**50**	**65**	**75**	**90**	**100**	**125**
Length, stem, mm	150	150	150	150	150	150	150
Quantity in case	72	72	72	72	48	48	36
Each	**$ .20**	**.22**	**.24**	**.28**	**.32**	**.36**	**.48**
Case	**$12.96**	**14.26**	**15.55**	**18.14**	**13.82**	**15.55**	**15.55**

170M3 Funnels, Glass, 60-Degree, Long Stem. Bowl exactly 60° angle with ground rim. Stem ground to point.

Diameter, mm.	**40**	**50**	**65**	**75**	**90**	**100**
Length, stem, mm	150	150	150	150	150	150
Quantity in case	72	72	72	72	48	48
Each	**$ .22**	**.25**	**.30**	**.34**	**.38**	**.44**
Case	**$14.26**	**16.20**	**19.44**	**22.03**	**16.42**	**19.01**

170M4 Funnels, Pyrex, 60-Degree, Plain. Bowl exactly 60° angle. With beaded rim and stem ground to point.

Diameter, mm.	**50**	**65**	**75**	**100**
Quantity in case	72	72	60	48
Each	**$ .32**	**.35**	**.38**	**.48**
Case	**$20.74**	**22.68**	**20.52**	**20.74**

170M5 Funnels, Pyrex, 60-Degree, Fluted. Bowl exactly 60° angle. With beaded rim and stem ground to point.

Diameter, mm.	**50**	**65**	**75**	**100**
Quantity in case	72	72	60	48
Each	**$ .35**	**.38**	**.42**	**.53**
Case	**$22.68**	**24.62**	**22.68**	**22.90**

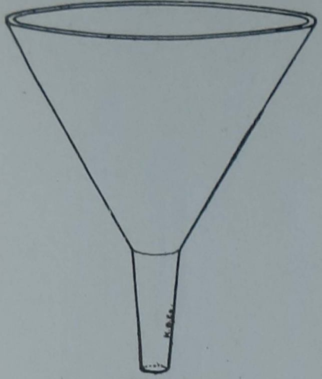
170M6 Funnels, Glass, Constricted Neck. Bowl approximately 60° angle. Stem ground to point.

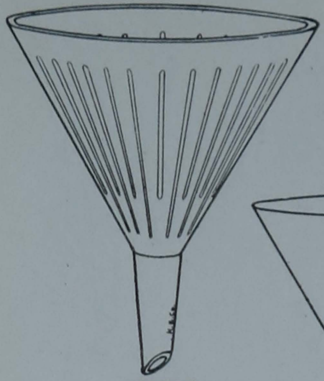
Diameter, mm.	**50**	**65**	**75**	**100**
Length, stem, mm	150	150	150	150
Quantity in case	36	36	24	18
Each	**$ .34**	**.40**	**.46**	**.54**
Case	**$11.02**	**12.96**	**9.94**	**8.75**

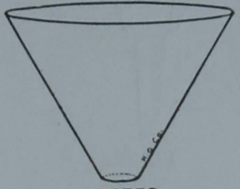
170M7 Funnels, Glass, with Loop in Stem.

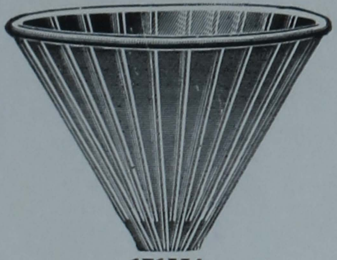
Diameter, mm.	65	75
Each	**$ .50**	**.60**

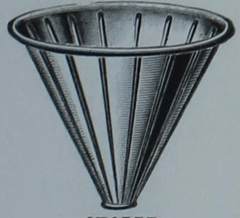
Funnels, Continued


171M1


171M2


171M3


171M4


171M5

171M1 Funnels, Heavy Glass, Plain. Press molded with short grooved stem.

Capacity, ounces	**1**	**2**	**4**	**8**	**16**	**32**
Diameter, inches	2¼	2 11/16	3½	4⅝	5⅝	7
Each	**$ .15**	**.20**	**.25**	**.30**	**.50**	**.75**

Capacity, gallons	**½**	**1**	**2**
Diameter, inches	8½	10⅞	12⅝
Each	**$1.00**	**1.50**	**3.25**

171M2 Funnels, Heavy Glass, Ribbed. With short grooved stem.

Capacity, ounces	**1**	**2**	**4**	**8**	**16**	**32**
Diameter, inches	2¼	2 11/16	3½	4⅝	5⅝	7
Each	**$ .15**	**.20**	**.25**	**.30**	**.50**	**.75**

Capacity, gallons	**½**	**1**	**2**
Diameter, inches	8½	10⅞	12⅝
Each	**$1.00**	**1.50**	**3.25**

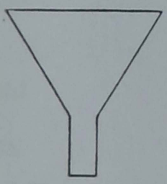
171M3 Funnels, Glass, Sugar, Plain. Without Stem. For sugar analysis.

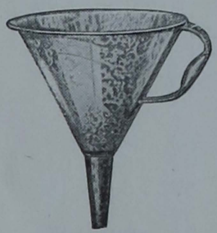
Diameter, inches	3	4
Each	**$ .30**	**.30**

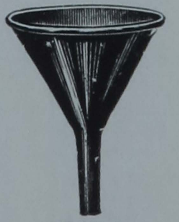
171M4 Funnels, Glass, Sugar, Ribbed. Without stem. For sugar analysis.

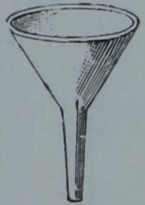
Diameter, inches	3	4
Each	**$ .30**	**.30**

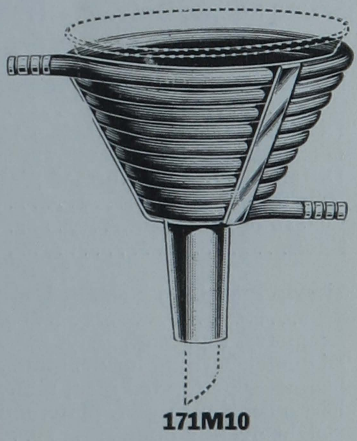
171M5 Funnels, Copper, Sugar, Ribbed. Without stem. Wire reinforced edges. Sanded finish inside. Outside highly polished. Diameter, 4⅛ inches. Opening diameter, 9/16 inches; depth, 3½ inches. **Each**.......... **$1.10**


171M6


171M7


171M8


171M9


171M10

171M6 Funnels, Glass, Powder. With short, wide stem. For powders and heavy liquids.

Diameter, top, mm.	**60**	**80**	**100**
Diameter, stem, mm.	14	16	18
Each	**$ .30**	**.36**	**.50**

171M7 Funnels, Agateware. Enameled both inside and outside.

Capacity, quarts	**½**	**1**	**2**	**4**
Diameter, inches	4½	5½	7¾	9
Each	**$ .45**	**.55**	**.70**	**.85**

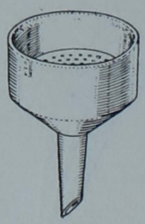
171M8 Funnels, Hard Rubber. Made with a corrugated spout to allow the air to escape while the bottle is being filled.

Capacity, ounces	**2**	**4**	**8**
Diameter, inches	2 9/16	3⅛	4¼
Each	**$ .75**	**1.00**	**1.75**

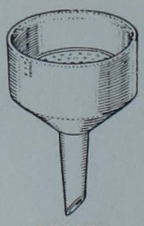
171M9 Funnels, Bakelite. Made of non-inflammable, transparent bakelite. Used for handling hydrofluoric acid. Diameter, 2 inches. **Each**.......... **$3.00**

171M10 Funnels, Coiled. For hot or cold filtrations, using steam, hot water, ice, or other media. Recommended for filtering inflammable liquids. Coil consists of about 9 feet of heavy copper tubing with ½-inch serrated hose nipples, and a heavy polished copper stem. Top diameter, inside, 5 inches. Glass funnel not supplied. **Each**.......... **$6.50**

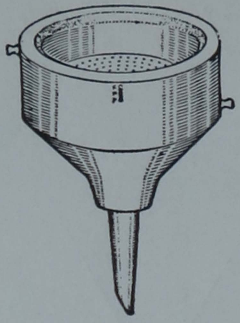
Funnels, Continued



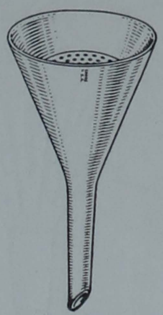
172M1



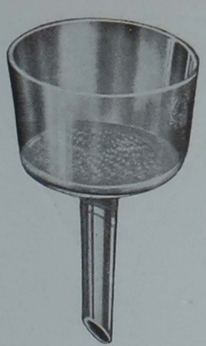
172M2



172M4



172M5



172M6

172M1 Funnels, Buchner, Coors Porcelain. With fixed perforated plate, glazed inside and outside with exception of rim.

Size	**0000***	**0**	**1**	**2**	**2A**	**3**	**4**	**4A**	**5**	**6**	**7**
Diameter, outside, mm.	19	51	67	85	106	127	142	171	213	269	338
Dia., perforated plate, inside, mm.	14.5	42	56	75	91	111	126	147	186	241	308
Diameter, perforated area, mm.	11	32	45	60	80	98	115	139	173	226	290
Distance, rim to perf. plate, mm.	8.5	24	30	39	46	53	59	61	70	90	125
Height, overall, mm.	33	89	101	143	160	195	202	221	270	350	452
Length of tube, mm.	16	46	47	70	71	80	88	103	115	160	195
Diameter of tube, mm.	4	13	14	16	20	21	22	25	26	29	34
Each	**$ .70**	**.80**	**1.00**	**1.65**	**2.15**	**2.35**	**4.00**	**4.65**	**5.95**	**10.00**	**18.15**

*Suitable for micro-analysis.

172M2 Funnels, Buchner, Coors Porcelain. With loose plate ground to fit. Can be thoroughly cleaned.

Size	**3**	**4**	**4A**	**5**	**6**
Diameter, inside	116	135	162	198	256
Diameter, plate, mm.	103	118	141	175	230
Diameter, perforated area, mm.	96	114	130	165	215
Height, overall	205	222	250	321	350
Diameter, stem, mm.	22	25	28	33	36
Each	**$5.95**	**7.15**	**8.35**	**10.70**	**14.20**

172M3 Plates, Only. For 172M2 funnels. **Each**	**$2.50**	**2.95**	**3.50**	**4.50**	**5.80**

172M4 Funnels, Buchner, Coors Porcelain. With water jacket, for circulation of water, steam, etc.; with inlet and outlet tubulatures for attaching rubber tubing.

Size	**1**	**2**	**2A**	**3**	**4**	**4A**	**5**	**6**
Diameter, inside perforated plate, mm.	56	75	91	111	126	147	186	241
Diameter, perforated area, mm.	45	60	80	98	115	139	173	226
Distance, rim to perforated plate, mm.	30	39	46	53	59	61	70	90
Height overall, mm.	101	143	160	195	202	221	270	350
Length of tube, mm.	47	70	71	80	88	103	115	160
Each	**$4.00**	**6.05**	**7.15**	**8.80**	**13.85**	**15.95**	**20.35**	**27.50**

172M5 Funnels, Hirsch, Coors Porcelain. With fixed perforated plate.

Size	**00000***	**0000***	**000**	**000A**	**000B**	**00**	**0**	**0A**	**0B**	**0C**	**0D**	**1**	**1A**	**2**	**3**	**4**
Diameter, top, mm.	42	55	50	65	54	78	94	90	92	98	94	103	103	118	140	163
Diameter bottom, inside, mm.	11.5	16	31	27	19	47	56	41	47	60	45	56	46	56	56	111
Diameter perforated area, mm.	8.5	11	21	22	16	32	45	31	32	44	38	45	32	45	45	100
Distance, rim to perf. plate, mm.	19.5	26	11	31	25	18	34	33	35	22	45	29	41	43	57	34
Height overall, mm.	80	64	59	116	108	122	165	150	121	130	170	137	131	167	180	185
Length of tube, mm.	48	30	30	65	68	68	72	93	52	70	78	66	56	84	87	80
Diameter of tube, mm.	7	13	11	13	12	13	16	17	15	17	15	16	14	19	19	19
Each	**$ .50**	**.66**	**.66**	**.85**	**.80**	**.85**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.35**	**1.35**	**1.65**	**2.30**	**3.00**

*Suitable for micro-analysis.

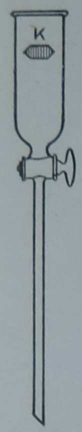
Funnels, Buchner, Jena Fritted Disc. Suitable for use in all cases where paper filters would be attacked or would not serve. Tested before leaving the factory to stand boiling water poured upon them. Furnished in two porosities.

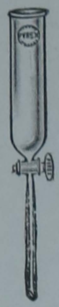
Capacity, ml.	**20**	**60**	**140**	**450**	**750**
Diameter of disc, mm.	20	40	65	90	120
Height above disc, mm.	45	50	50	85	85
Diameter of tube, approximate, mm.	7	8	10	15	20
172M6 Medium Porosity. Each	**$2.70**	**3.10**	**5.20**	**9.30**	**15.50**
172M7 Dense Porosity. Each	**$2.70**	**3.10**	**5.20**	**9.30**	**15.50**

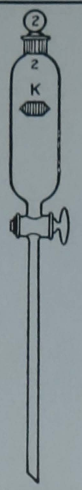
172M8 Funnels, Buchner, Jena, Slit Sieve. Perfectly transparent. Has a plane surface, so that the filter paper covers it closely.

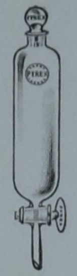
Capacity, ml.	**50**	**90**	**200**	**450**	**900**
For filter paper, size, mm.	45	55	70	90	110
Diameter of stem, mm.	10	10	23	23	23
Height, total, mm.	125	145	160	210	230
Each	**$2.75**	**3.10**	**3.85**	**4.65**	**5.50**

Funnels, Continued


173M1


173M2


173M3


173M4

173M1 Funnels, Separatory, Cylindrical. With open top and long stem.

Capacity, ml.	125	250
Quantity in case	18	12
Each	**$ 1.20**	**1.40**
Case	**$19.44**	**15.12**

173M2 Funnels, Separatory, Pyrex, Cylindrical. With open top.

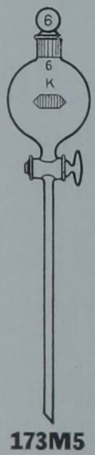
Capacity, ml.	60	125	250
Quantity in case	12	12	6
Each	**$ 2.00**	**2.50**	**3.00**
Case	**$21.60**	**27.00**	**16.20**

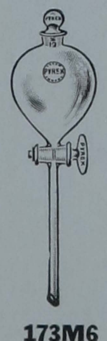
173M3 Funnels, Separatory, Cylindrical. With ground glass stoppers. The 500 and 1000 ml. sizes have short stems and heavier walls.

Capacity, ml.	60	125	250	500	1000
Quantity in case	18	18	18	12	6
Each	**$ 1.25**	**1.25**	**1.60**	**1.90**	**2.40**
Case	**$20.25**	**20.25**	**25.92**	**20.52**	**12.96**

173M4 Funnels, Separatory, Pyrex, Cylindrical. Glass stoppered.

Capacity, ml.	60	125	250	500	1000	2000
Quantity in case	12	12	6	6	6	4
Each	**$ 3.00**	**3.50**	**4.00**	**4.75**	**7.00**	**10.00**
Case	**$32.40**	**37.80**	**21.60**	**25.65**	**37.80**	**36.00**


173M5

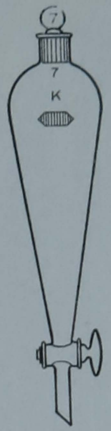

173M6

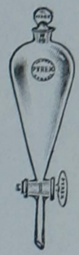
173M5 Funnels, Separatory, Globe Shaped. With ground glass stoppers.

Capac., ml.	30	60	125	250	500	1000	2000
Quan. in case	18	18	18	12	12	6	4
Each	**$ 1.25**	**1.25**	**1.25**	**1.60**	**1.90**	**2.40**	**4.00**
Case	**$20.25**	**20.25**	**20.25**	**17.28**	**20.52**	**12.96**	**14.40**

173M6 Funnels, Separatory, Pyrex, Globe Shaped.

Capacity, ml.	60	125	250	500	1000
Quantity in case	12	12	6	6	6
Each	**$ 3.00**	**3.50**	**4.00**	**4.75**	**7.00**
Case	**$32.40**	**37.80**	**21.60**	**25.65**	**37.80**
Capacity, ml., continued			**2000**	**4000**	**6000**
Quantity in case			4	3	2
Each			**$10.00**	**13.50**	**17.50**
Case			**$36.00**	**36.45**	**31.50**


173M7

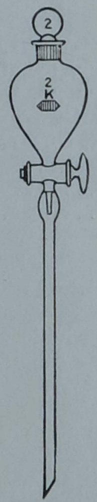

173M8

173M7 Funnels, Separatory, Squibb's Pear Shaped. With ground glass stoppers.

Capacity, ml.	125	250	500	1000	2000
Quantity in case	18	12	12	12	4
Each	**$ 1.25**	**1.60**	**1.90**	**2.40**	**4.00**
Case	**$20.25**	**17.28**	**20.52**	**25.92**	**14.40**

173M8 Funnels, Separatory, Pyrex, Squibb's Pear Shaped. With ground glass stoppers.

Capacity, ml.	60	125	250	500	1000	2000
Quantity in case	12	12	6	6	6	4
Each	**$ 3.00**	**3.50**	**4.00**	**4.75**	**7.00**	**10.00**
Case	**$32.40**	**37.80**	**21.60**	**25.65**	**37.80**	**36.00**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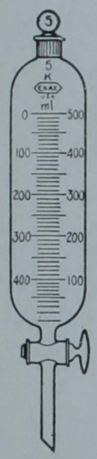
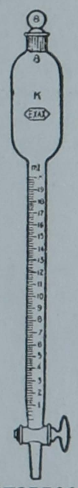

173M10


173M11

173M9 Funnels, Dropping, Walters. The lower stem has an enlargement just below the stopcock, and a small tip is sealed in at this point to allow delivery in single drops. The capacity of the funnel is approximately 60 ml.

Each, $1.80. Case of 18 .... **$29.16**

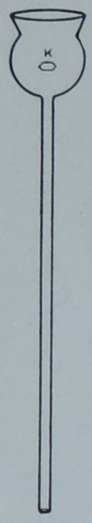
173M10 Funnels, Separatory, Exax Blue Line. Cylindrical, Graduated. With glass stoppered top. The 500 and 1000 ml. sizes have short stems and are of slightly heavier glass.

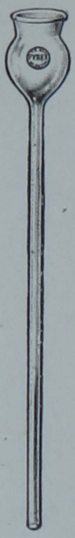
Capacity, ml.	125	250	500	1000
Graduated, ml.	1	5	5	10
Quantity in case	18	18	12	6
Each	**$ 2.60**	**3.20**	**4.00**	**6.00**
Case	**$37.44**	**46.08**	**38.40**	**28.80**

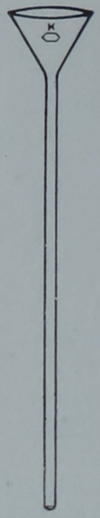
173M11 Funnels, Separatory, Exax Blue Line. A. S. T. M. D-370. Used also in tests B-2, B-3, H-2 and H-12 of the Barrett Company. The capacity is approximately 120 ml. with the lower stem graduated up to 20 ml. from the stopcock in $^1/_{10}$ ml.

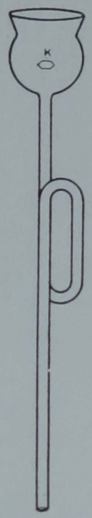
Each **$3.50**

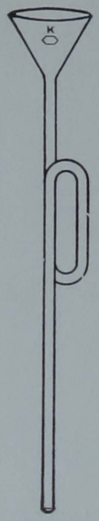
Funnel Tubes

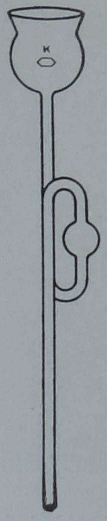

174M1

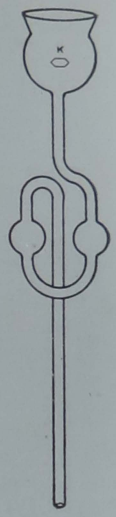

174M2


174M3


174M4


174M5


174M6


174M7

174M1 Funnel Tubes, Thistle Top. Diameter of top, 45 mm.; diameter of stem, 6 to 7 mm. for standard holes in rubber stoppers.

Length of stem, mm	300	400
Each	$ .10	.12
Case of 72	$6.48	7.78

174M2 Funnel Tubes, Pyrex, Thistle Top. Moulded construction.
Diameter of top, 32 mm.; length, 350 mm. **Each**......$ .15
Case of 72......$9.72

174M3 Funnel Tubes, Cone Top. Diameter of top, 45 mm.; diameter of stem, 6 to 7 mm. for standard holes in rubber stoppers; length of stem, 300 mm. **Each**......$ .12
Case of 72......$7.78

174M4 Funnel Tubes, Thistle Top. With loop in stem. Diameter of top, 45 mm.; diameter of stem, 6 to 7 mm. for standard holes in rubber stoppers; length of stem, 300 mm.
Each......$ .30
Case of 72......$19.44

174M5 Funnel Tubes, Cone Top. With loop in stem. Diameter of top, approximately 45 mm.; diameter of stem, 6 to 7 mm. for standard holes in rubber stoppers; length of stem, 300 mm. **Each**......$ .30
Case of 72......$19.44

174M6 Funnel Tubes, Thistle Top. With loop and one bulb in stem. Diameter of top, 45 mm.; diameter of stem, 6 to 7 mm. for standard holes in rubber stoppers; length of stem, 300 mm. **Each**......$ .30
Case of 48......$12.96

174M7 Funnel Tubes, Thistle Top. With two loops in stem and bulb in each. For use with Kipp and other gas generators. Diameter of top, 45 mm.; diameter of stem 6 to 7 mm. for standard holes in rubber stoppers; length of stem, 300 mm. **Each**......$ .50
Case of 36......$16.20

Furnaces, Assay

Furnaces, Assay Muffle, Oil Fired. Designed especially for burning oil, these furnaces consist of one or more muffle units of the same general construction available in three standard muffle sizes. They are listed on the following pages complete with suitable burners, and equipment of the type to provide the air requirements from the facilities available.

Muffle Units. Heavily insulated to provide quick heating and economical operation, and can be brought to working temperature in forty-five minutes. The muffle is evenly supported and protected from direct flame by muffle support parts which reduce flame abrasion, warping and cracking, and provide a more even temperature throughout the muffle. Each muffle-unit is self-contained, with door, burner, hood and stack, permitting the operation of single units in multi-unit furnaces. Furnaces with two or three muffle units are mounted on one stand. Air may be supplied to any number of muffle units by one blower and oil supplied from one tank. Muffle doors are lined with an insulating refractory, easily replaced, and swing on a jointed arm for partial or complete exposure of the muffle opening.

Burners. Low pressure burners are used with the high speed, low pressure electric motor-blower, and give quiet and economical operation. Medium pressure burners are used with positive pressure blowers or with pressure reducing valves on high pressure air lines. For further description see page 61.

Air Supply Equipment. High speed low pressure electric motor blowers are the quietest and most economical source of air supply and are further described on page 35. For use only on D. C. and 50 or 60 cycle A. C. 25-cycle current will not furnish sufficient blower speed. Positive pressure blowers are for use where 50- or 60-cycle current is not available and may be driven by V-belts and electric motor with current of any cycle, and may also be driven from a line shaft or other form of motive power. Pressure reducing valves are for use when air requirements must be supplied from a high pressure air line.

High Altitude Equipment. If the furnace installation is above 10,500 feet altitude, special provisions for air supply may be necessary, requiring equipment furnished at extra charge.

Oil Tank. 30-gallon capacity, equipped with strainer and float to indicate quantity of fuel in tank.

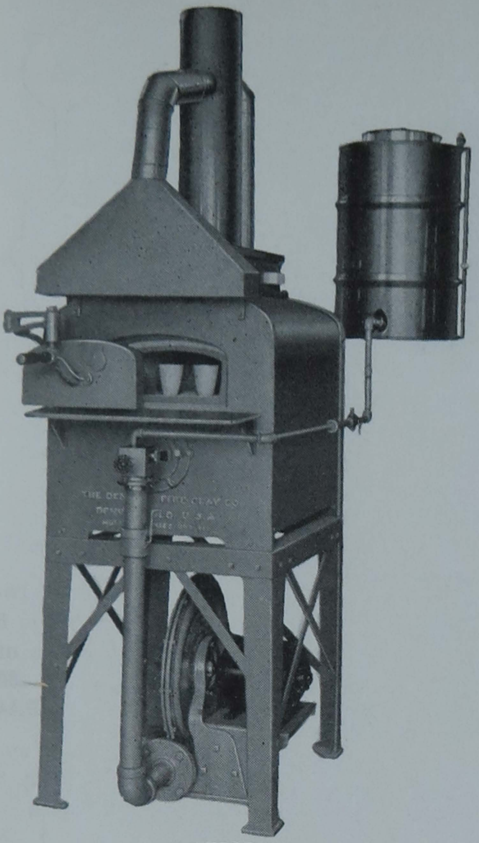
Fuel. The burners will atomize any oil of a gravity above 24 degrees Baume. The fuel consumption is approximately one gallon per hour per burner after furnace reaches operating temperature.

Muffles and Muffle Supports. Furnaces are furnished with clay muffles and clay muffle supports, or Silcar muffles and Silcar muffle supports, as selected. The clay muffles and supports are of the highest quality refractory clay. The Silcar muffles and supports are silicon carbide, and have much greater mechanical strength and thermal conductivity than clay. The use of Silcar muffles and supports allows quicker and more even heat distribution throughout the muffle, and requires fewer replacements. Silcar muffle supports as furnished include the stools, muffle baffle plates and front and back muffle protector plates.

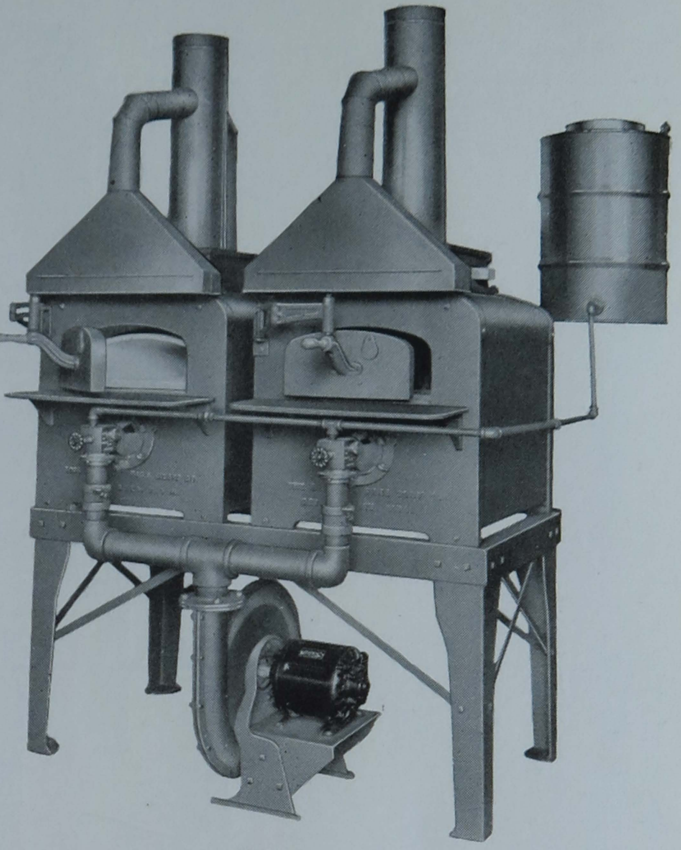
Extra Parts. Complete listing of all muffle-unit parts will be found on page 179. We recommend the purchase of two extra clay muffles and one set of supports, or one extra Silcar muffle by domestic users; six extra clay muffles and three sets of supports, or three extra Silcar muffles and one set of Silcar supports by foreign users.

Exports. The prices shown on furnaces are for domestic packing. For packing for ocean shipment 5% should be added to the prices shown to cover the extra cost involved.

Furnaces, Assay, Continued



175M1



175M2

Furnaces, Assay Muffle, Oil Fired
With high speed, low pressure electric motor blower

Electric motor blower is for operation on 110, 220 or 440-volt single or three-phase alternating current of 50 or 60 cycles only, and 110 or 220-volts direct current.

Complete with full equipment for operation, including stand, oil tank, set of pipe and fittings for oil and air lines, and one or more muffle units. Each muffle unit includes low pressure burner; hood; door; one length of 8-inch diameter clay-lined stack; and clay muffle and clay muffle supports or Silcar muffle and Silcar muffle supports, as selected. Equipment described on preceding page. When ordering specify voltage, phase and cycle of current.

With Clay Muffles and Clay Muffle Supports

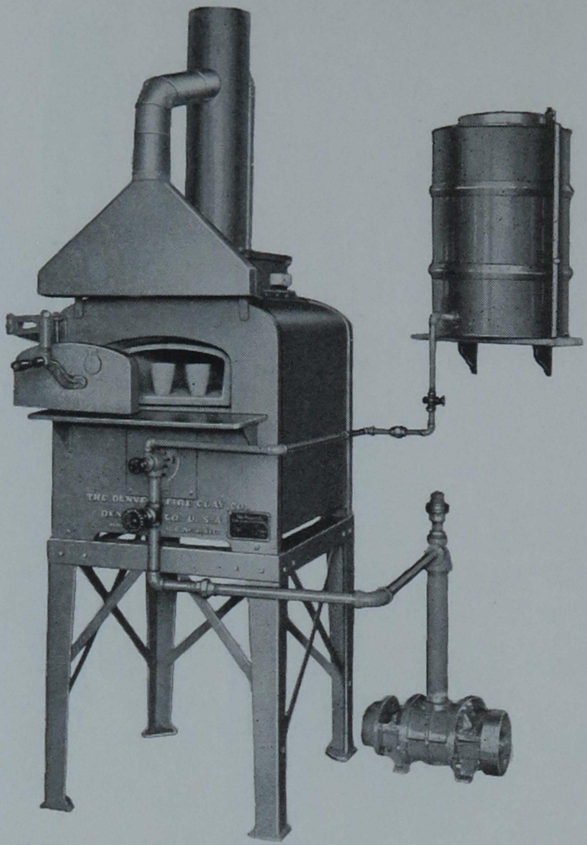
	Inside Muffle Dimensions Inches*	Capacity 20-gram Crucibles	Burners	Blower Type	Floor Space Inches	Gross Weight Pounds	**Each**
175M1 Single LF Muffle Furnace	10½x19½x6½	18	One size 1	200	28x32	2180	**$350.00**
175M2 Double LF Muffle Furnace	10½x19½x6½	36	Two size 1	250	57x32	3705	**590.00**
175M3 Triple LF Muffle Furnace	10½x19½x6½	54	Three size 1	250	86x32	5890	**785.00**
175M4 Single LG Muffle Furnace	13¼x20¼x6	24	One size 2	200	30x32	2400	**360.00**
175M5 Double LG Muffle Furnace	13¼x20¼x6	48	Two size 2	250	65x32	4385	**610.00**
175M6 Triple LG Muffle Furnace	13¼x20¼x6	72	Three size 2	250	93x32	6310	**815.00**
175M7 Single LJ Muffle Furnace	15x24x7¼	30	One size 2	250	33x34	2670	**400.00**
175M8 Double LJ Muffle Furnace	15x24x7¼	60	Two size 2	250	68x34	4920	**700.00**
175M9 Triple LJ Muffle Furnace	15x24x7¼	90	Three size 2	250	103x34	7080	**935.00**

With Silcar Muffles and Silcar Muffle Supports

	Inside Muffle Dimensions Inches*	Capacity 20-gram Crucibles	Burners	Blower Type	Floor Space Inches	Gross Weight Pounds	**Each**
175M10 Single LF Muffle Furnace	10½x19½x6½	18	One size 1	200	28x32	2230	**$383.00**
175M11 Double LF Muffle Furnace	10½x19½x6½	36	Two size 1	250	57x32	3805	**657.00**
175M12 Triple LF Muffle Furnace	10½x19½x6½	54	Three size 1	250	86x32	6040	**885.00**
175M13 Single LG Muffle Furnace	13¼x20¼x6	24	One size 2	200	30x32	2450	**398.00**
175M14 Double LG Muffle Furnace	13¼x20¼x6	48	Two size 2	250	53x32	4485	**685.00**
175M15 Triple LG Muffle Furnace	13¼x20¼x6	72	Three size 2	250	93x32	6460	**928.00**
175M16 Single LJ Muffle Furnace	15x24x7¼	30	One size 2	250	33x34	2720	**449.00**
175M17 Double LJ Muffle Furnace	15x24x7¼	60	Two size 2	250	68x34	5020	**798.00**
175M18 Triple LJ Muffle Furnace	15x24x7¼	90	Three size 2	250	103x34	7320	**1083.00**

Parts for above furnaces are on page 179.
Muffles for above furnaces are on pages 275 and 276.
*Outside muffle dimensions are on pages 275 and 276.
For ocean shipment packing add 5%.

Furnaces, Assay, Continued



176M1

Furnaces, Assay Muffle, Oil Fired
With positive pressure blower for belt drive

Blower may be driven by electric motor, or if no current is available, may be driven from line shaft, gasoline engine or other form of motive power. Speed of blower as shown below is that required for altitudes of 5000 feet or lower.

Complete with full equipment for operation, including stand, oil tank, set of pipe and fittings for oil and air lines, and one or more muffle units. Each muffle unit includes medium pressure burner; hood; door; one length of 8-inch diameter, clay-lined stack; and clay muffle and clay muffle supports or Silcar muffle and Silcar muffle supports, as selected. Equipment described on page 174.

With Clay Muffles and Clay Muffle Supports

	Inside Muffle Dimensions Inches*	Capacity 20-gram Crucibles	Blower Speed R. P. M.	H. P. Required	Floor Space Inches	Gross Weight Pounds	Each
176M1 Single LF Muffle Furnace	10½x19½x6½	18	780	.95	28x32	2180	**$310.00**
176M2 Double LF Muffle Furnace	10½x19½x6½	36	820	1.35	57x32	3705	**500.00**
176M3 Triple LF Muffle Furnace	10½x19½x6½	54	1100	1.70	86x32	5890	**710.00**
176M4 Single LG Muffle Furnace	13¼x20¼x6	24	780	.95	30x32	2400	**320.00**
176M5 Double LG Muffle Furnace	13¼x20¼x6	48	820	1.35	63x32	4385	**520.00**
176M6 Triple LG Muffle Furnace	13¼x20¼x6	72	1100	1.70	93x32	6310	**740.00**
176M7 Single LJ Muffle Furnace	15x24x7¼	30	1020	1.25	33x34	2670	**360.00**
176M8 Double LJ Muffle Furnace	15x24x7¼	60	1110	1.75	68x34	4920	**600.00**
176M9 Triple LJ Muffle Furnace	15x24x7¼	90	835	2.90	103x34	7080	**860.00**

With Silcar Muffles and Silcar Muffle Supports

	Inside Muffle Dimensions Inches*	Capacity 20-gram Crucibles	Blower Speed R. P. M.	H. P. Required	Floor Space Inches	Gross Weight Pounds	Each
176M10 Single LF Muffle Furnace	10½x19½x6½	18	780	.95	28x32	2230	**$343.00**
176M11 Double LF Muffle Furnace	10½x19½x6½	36	820	1.35	57x32	3805	**567.00**
176M12 Triple LF Muffle Furnace	10½x19½x6½	54	1100	1.70	86x32	6040	**810.00**
176M13 Single LG Muffle Furnace	13¼x20¼x6	24	780	.95	30x32	2450	**358.00**
176M14 Double LG Muffle Furnace	13¼x20¼x6	48	820	1.35	63x32	4485	**595.00**
176M15 Triple LG Muffle Furnace	13¼x20¼x6	72	1100	1.70	93x32	6460	**853.00**
176M16 Single LJ Muffle Furnace	15x24x7¼	30	1020	1.25	33x34	2720	**409.00**
176M17 Double LJ Muffle Furnace	15x24x7¼	60	1110	1.75	68x34	5020	**698.00**
176M18 Triple LJ Muffle Furnace	15x24x7¼	90	835	2.90	103x34	7230	**1008.00**

Parts for above furnaces are on page 179.
Muffles for above furnaces are on pages 275 and 276.
*Outside muffle dimensions are shown on pages 275 and 276.
For ocean shipment packing add 5%.

Furnaces, Assay, Continued

Furnaces, Assay Muffle, Oil Fired
With positive pressure blower driven by V-belts and electric motor

Electric motor and blower are mounted together on one base. Motor is for operation on direct current or alternating current of any cycle. Complete with full equipment for operation, including stand, oil tank, set of pipe and fittings for oil and air lines, and one or more muffle units. Each muffle unit includes medium pressure burner; hood; door; one length of 8-inch diameter, clay-lined stack; and clay muffle and clay muffle supports or Silcar muffle and Silcar muffle supports, as selected. Equipment described on page 174. When ordering be sure to specify voltage, phase and cycle of current.

With Clay Muffles and Clay Muffle Supports

	Inside Muffle Dimensions, Inches*	Capacity 20-Gram Crucibles	Floor Space Inches	Gross Weight Pounds	**Each**
177M1 Single LF Muffle Furnace	10½x19½x6½	18	28x32	2180	**$410.00**
177M2 Double LF Muffle Furnace	10½x19½x6½	36	57x32	3705	**600.00**
177M3 Triple LF Muffle Furnace	10½x19½x6½	54	86x32	5890	**835.00**
177M4 Single LG Muffle Furnace	13¼x20¼x6	24	30x32	2400	**420.00**
177M5 Double LG Muffle Furnace	13¼x20¼x6	48	63x32	4385	**620.00**
177M6 Triple LG Muffle Furnace	13¼x20¼x6	72	93x32	6310	**865.00**
177M7 Single LJ Muffle Furnace	15x24x7¼	30	33x34	2670	**460.00**
177M8 Double LJ Muffle Furnace	15x24x7¼	60	68x34	4920	**700.00**
177M9 Triple LJ Muffle Furnace	15x24x7¼	90	103x34	7080	**985.00**

With Silcar Muffles and Silcar Muffle Supports

	Inside Muffle Dimensions, Inches*	Capacity 20-Gram Crucibles	Floor Space Inches	Gross Weight Pounds	**Each**
177M10 Single LF Muffle Furnace	10½x19½x6½	18	28x32	2230	**$443.00**
177M11 Double LF Muffle Furnace	10½x19½x6½	36	57x32	3805	**667.00**
177M12 Triple LF Muffle Furnace	10½x19½x6½	54	86x32	6040	**935.00**
177M13 Single LG Muffle Furnace	13¼x20¼x6	24	30x32	2450	**458.00**
177M14 Double LG Muffle Furnace	13¼x20¼x6	48	63x32	4485	**695.00**
177M15 Triple LG Muffle Furnace	13¼x20¼x6	72	93x32	6460	**978.00**
177M16 Single LJ Muffle Furnace	15x24x7¼	30	33x34	2720	**509.00**
177M17 Double LJ Muffle Furnace	15x24x7¼	60	68x34	5020	**798.00**
177M18 Triple LJ Muffle Furnace	15x24x7¼	90	103x34	7230	**1133.00**

Furnaces, Assay Muffle, Oil Fired
With pressure reducing valve for high pressure air supply

The pressure reducing valve lowers the pressure from a high pressure air supply to that suitable for the medium pressure burner, and no blower is required.

Complete with full equipment for operation, including stand, oil tank, set of pipe and fittings for oil and air lines, and one or more muffle units. Each muffle unit includes medium pressure burner; hood; door; one length of 8-inch diameter, clay-lined stack; and clay muffle and clay muffle supports or Silcar muffle and Silcar muffle supports, as selected. Equipment described on page 174.

With Clay Muffles and Clay Muffle Supports

	Inside Muffle Dimensions, Inches*	Capacity 20-Gram Crucibles	Floor Space Inches	Gross Weight Pounds	**Each**
177M19 Single LF Muffle Furnace	10½x19½x6½	18	28x32	2180	**$290.00**
177M20 Double LF Muffle Furnace	10½x19½x6½	36	57x32	3705	**480.00**
177M21 Triple LF Muffle Furnace	10½x19½x6½	54	86x32	5890	**670.00**
177M22 Single LG Muffle Furnace	13¼x20¼x6	24	30x32	2400	**300.00**
177M23 Double LG Muffle Furnace	13¼x20¼x6	48	63x32	4385	**500.00**
177M24 Triple LG Muffle Furnace	13¼x20¼x6	72	93x32	6310	**700.00**
177M25 Single LJ Muffle Furnace	15x24x7¼	30	33x34	2670	**340.00**
177M26 Double LJ Muffle Furnace	15x24x7¼	60	68x34	4920	**580.00**
177M27 Triple LJ Muffle Furnace	15x24x7¼	90	103x34	7080	**820.00**

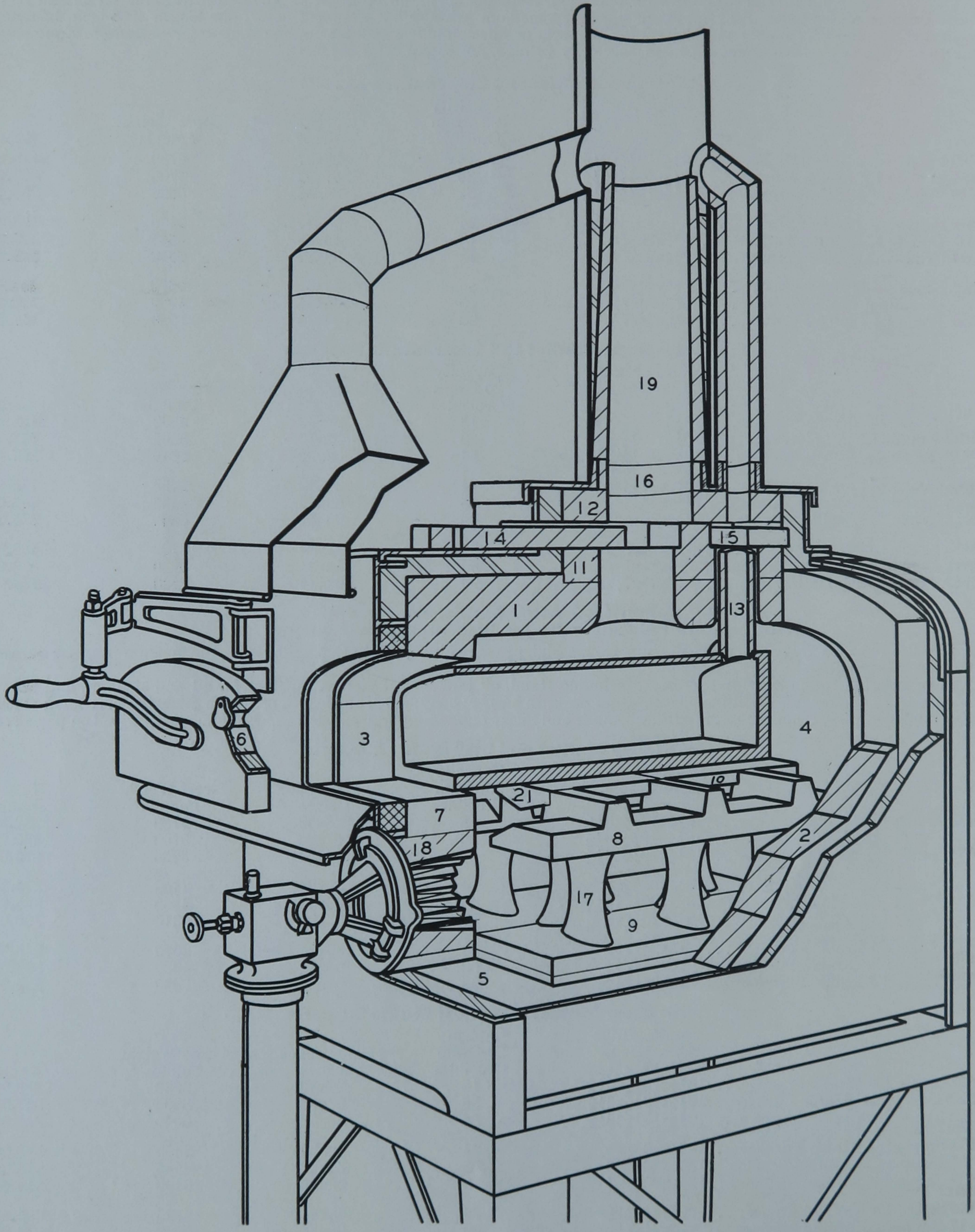
With Silcar Muffles and Silcar Muffle Supports

	Inside Muffle Dimensions, Inches*	Capacity 20-Gram Crucibles	Floor Space Inches	Gross Weight Pounds	**Each**
177M28 Single LF Muffle Furnace	10½x19½x6½	18	28x32	2230	**$323.00**
177M29 Double LF Muffle Furnace	10½x19½x6½	36	57x32	3805	**547.00**
177M30 Triple LF Muffle Furnace	10½x19½x6½	54	86x32	6040	**770.00**
177M31 Single LG Muffle Furnace	13¼x20¼x6	24	30x32	2450	**338.00**
177M32 Double LG Muffle Furnace	13¼x20¼x6	48	63x32	4485	**575.00**
177M33 Triple LG Muffle Furnace	13¼x20¼x6	72	93x32	6460	**813.00**
177M34 Single LJ Muffle Furnace	15x24x7¼	30	33x34	2720	**389.00**
177M35 Double LJ Muffle Furnace	15x24x7¼	60	68x34	5020	**678.00**
177M36 Triple LJ Muffle Furnace	15x24x7¼	90	103x34	7230	**968.00**

Parts for above furnaces are on page 179.
Muffles for above furnaces are on pages 275 and 276.

*Outside muffle dimensions are shown on pages 275 and 276.
For ocean shipment packing, add 5%.

Furnace Replacement Parts for Oil Fired Assay Muffle Furnaces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Furnace Replacement Parts for Oil Fired Assay Muffle Furnaces

179M1 Clay Parts. When ordering specify part number and the serial number of your furnace.

Description	Number Required per Muffle Unit	For Muffle Unit LF			For Muffle Unit LG			For Muffle Unit LJ		
		Part No.	Weight Pounds	**Each**	Part No.	Weight Pounds	**Each**	Part No.	Weight Pounds	**Each**
Top Tile	1	LF 1	146	**$15.00**	LG 1	161	**$16.00**	LJ 1	260	**$20.00**
Side Tile, Right	1	LF 2	80	**9.00**	LG 2	100	**10.00**	LJ 2	150	**22.00**
Side Tile, Left	1	LF 3	80	**9.00**	LG 3	100	**10.00**	LJ 3	150	**22.00**
Back Tile	1	LF 4	111	**11.00**	LG 4	111	**11.00**	LJ 4	180	**15.00**
Bottom Tile	1	LF 5	139	**14.00**	LG 5	144	**15.00**	LJ 5	250	**18.00**
Door Lining Mixture	1	LF 6	11	**.80**	LG 6	11	**.90**	LJ 6	16	**1.00**
Door Lining Tile	1	LF 6T	6	**.80**	LG 6T	6	**.90**	LJ 6T	8	**1.00**
Front Tile	2	LF 7	15	**1.50**	LG 7	17	**1.75**	LJ 7	20	**2.00**
Muffle Baffle Plate	2	LF 8	14	**1.00**	LG 8	17	**1.00**	LJ 8	22	**1.25**
Combustion Chamber, Bottom	2	LF 9	11	**.45**	LG 9	13	**.45**	LJ 9	15	**.60**
Muffle Protector Plate, Rear	1	LF 10	4	**.20**	LG 10	4	**.20**	LJ 10	5	**.30**
Damper Block	1	LF 11	30	**3.50**	LG 11	30	**3.50**	LJ 11	32	**4.00**
Damper Block Cover	1	LF 12	15	**2.00**	LG 12	15	**2.00**	LJ 12	15	**2.50**
Damper Block Cover. For furnaces without separate muffle vent stack	1	LF 12A	15	**2.00**	LG 12A	15	**2.00**	LJ 12A	15	**2.50**
Muffle Flue	1	LF 13	2	**.40**	LG 13	2	**.40**	LJ 13	3	**.50**
Furnace Damper	1	LF 14	8	**.50**	LG 14	8	**.50**	LJ 14	8	**.50**
Muffle Damper	1	LF 15	4	**.40**	LG 15	4	**.40**	LJ 15	6	**.40**
Stack Ring	1	LF 16	2	**.30**	LG 16	2	**.30**	LJ 16	2	**.30**
Streamline Stools	*	LF 17	2	**.20**	LG 17	2	**.20**	LJ 17	2	**.20**
Burner Tile	1	LF 18	10	**.50**	LG 18	10	**.50**	LJ 18	10	**.50**
Stack Lining	1	LF 19	10	**2.40**	LG 19	10	**2.40**	LJ 19	10	**2.40**
Muffle Protector Plate, Front	1	LF 21	3	**.20**	LG 21	3	**.20**	LJ 21	4	**.30**

*Muffle units LF and LG require 8 streamline stools. Muffle unit LJ requires 14 streamline stools.
For clay muffles, see page 276.
For semi-muffles (muffle hearths), see page 277.

179M2 Clay Lined Furnace Stack. For use with LF, LG or LJ muffle units. With connection openings for hood and muffle vent flues. Diameter, 8 inches. **Each** **$6.00**

179M3 Clay Lined Furnace Stack. For use with 179M2 for increased stack height. Length, 24 inches; diameter, 8 inches. **Each** **$4.75**

179M4 Clay Lined Muffle Vent Stack. For use with LF, LG or LJ muffle units. Diameter, 4 inches. **Each** **$2.25**

179M5 Clay Lined Elbow. For connecting 179M4 to 179M2. **Each** **$1.25**

179M6 Hood, Only. Not clay-lined. For use with LF, LG or LJ muffle units. **Each** **$4.50**

179M7 Elbow, Only. Not clay-lined. For connecting 179M6 to 179M2. **Each** **$1.00**

179M8 Muffle Support Sets, Clay, LF. Complete set of clay supports for LF muffle unit consisting of two Part LF 8 muffle baffle plates; one Part LF 10 muffle protector plate, rear; one Part LF 21 muffle protector plate, front; and eight Part LF 17 streamline stools. **Set,** packed for domestic shipment, **$4.00.** **Set,** packed for ocean shipment **$4.75**

179M9 Muffle Support Sets, Clay LG. Complete set of clay support for LG muffle unit consisting of two Part LG 8 muffle baffle plates; one Part LG 10 muffle protector plate, rear; one Part LG 21 muffle protector plate, front; and eight Part LG 17 streamline stools. **Set,** packed for domestic shipment, **$4.00.** **Set,** packed for ocean shipment **$4.75**

179M10 Muffle Support Sets, Clay LJ. Complete set of clay supports for LJ muffle unit consisting of two Part LJ 8 muffle baffle plates; one Part LJ 10 muffle protector plate, rear; one Part LJ 21 muffle protector plate, front; and fourteen Part LJ 17 streamline stools. **Set,** packed for domestic shipment, **$5.90.** **Set,** packed for ocean shipment **$6.75**

179M11 Silcar Parts. When ordering specify part number and the serial number of your furnace.

Description	Number Required per Muffle Unit	For Muffle Unit LF			For Muffle Unit LG			For Muffle Unit LJ		
		Part No.	Weight Pounds	**Each**	Part No.	Weight Pounds	**Each**	Part No.	Weight Pounds	**Each**
Muffle Baffle Plates	2	LF 8S	18	**$5.85**	LG8S	20	**$6.45**	LJ8S	30	**$7.00**
Combustion Chamber Bottom	2	LF 9S	15	**3.85**	LG 9S	17	**4.50**	LJ 9S	20	**5.60**
Muffle Protector Plate, Rear	1	LF 10S	5	**2.30**	LG 10S	6	**2.40**	LJ 10S	7	**2.60**
Muffle Flue	1	LF 13S	2	**2.90**	LG 13S	2	**2.90**	LJ 13S	2	**3.10**
Streamline Stools	*	LF 17S	3	**1.05**	LG 17S	3	**1.05**	LJ 17S	3	**1.05**
Muffle Protector Plate, Front	1	LF 21S	4	**1.85**	LG 21S	4	**1.90**	LJ 21S	5	**2.30**

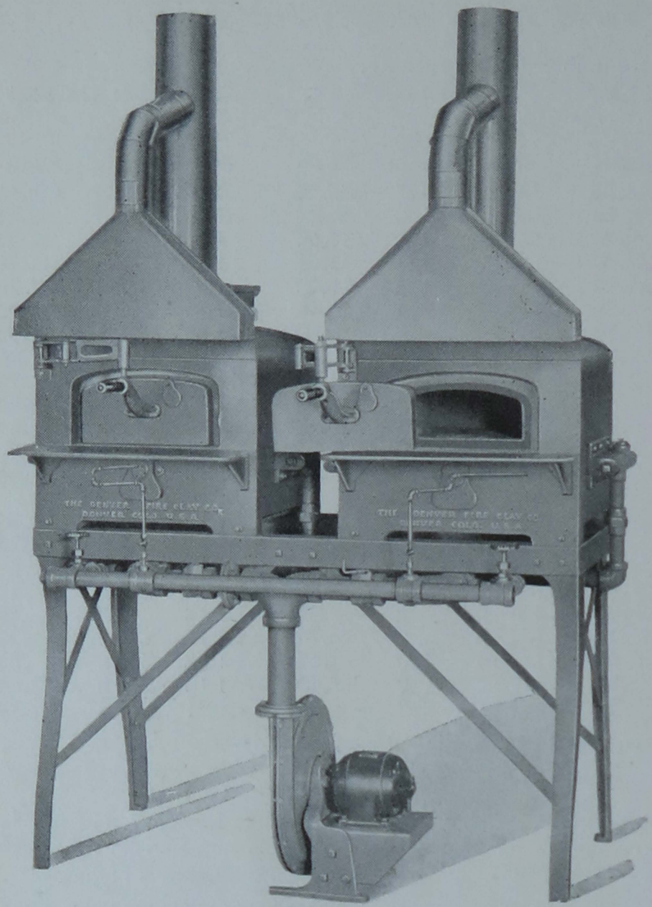
*Muffle units LF and LG require 8 streamline stools. Muffle unit LJ requires 14 streamline stools.
For Silcar muffles, see page 275.
For Silcar semi-muffles (muffle hearths), see page 277.

179M12 Muffle Support Sets, Silcar, LF. Complete set of Silcar supports for LF muffle unit consisting of two Part LF 8S muffle baffle plates; one Part LF 10S muffle protector plate, rear; one Part LF 21S muffle protector plate, front; and eight Part LF 17S streamline stools. **Set,** packed for domestic shipment, **$24.25.** **Set,** packed for ocean shipment **$26.00**

179M13 Muffle Support Sets, Silcar, LG. Complete set of Silcar supports for LG muffle unit consisting of two Part LG 8S muffle baffle plates; one Part LG 10S muffle protector plate, rear; one Part LG 21S muffle protector plate, front; and eight Part LG 17-S streamline stools. **Set,** packed for domestic shipment, **$25.60.** **Set,** packed for ocean shipment **$27.50**

179M14 Muffle Support Sets, Silcar, LJ. Complete set of Silcar supports for LJ muffle unit consisting of two Part LJ 8S muffle baffle plates; one Part LJ 10S muffle protector plate, rear; one Part LJ 21S muffle protector plate, front; and fourteen Part LJ 17-S streamline stools. **Set,** packed for domestic shipment, **$33.60.** **Set,** packed for ocean shipment **$36.00**

Furnaces, Assay, Continued



180M8

Furnaces, Assay Muffle, Gas Fired, Low Pressure, with High Speed Electric Motor Blower. For use where natural or artificial gas and 50 or 60-cycle alternating current or direct current are available. Consist of one or more muffle units of the same general construction, available in three standard muffle sizes. Each muffle unit is heavily insulated to provide quick heating and economical operation, and is self-contained with door, burner, hood and stack permitting the operation of single units in multi-unit furnaces. Furnaces with two or three muffle units are mounted on one stand, and air may be supplied to any number of units from one blower. Muffle doors are lined with an insulating refractory, easily replaced, and swing on a jointed arm for partial or complete exposure of the muffle opening.

Burners of the manifold type introduce the gas-air mixture into the combustion chamber at several points to insure efficient and uniform heat distribution, and provide almost noiseless operation.

Furnaces are furnished with clay muffles and clay muffle supports, or Silcar muffles and Silcar muffle supports, as selected, the Silcar parts having much higher mechanical strength and thermal-conductivity than clay.

Each furnace is complete with full equipment for operation including high speed, low pressure, electric motor blower for operation on 110, 220 or 440-volt, single or three-phase alternating current of 50 or 60 cycles only, or 110 or 220-volt direct current; stand; set of gas and air lines; and one or more muffle units. Each muffle unit includes burner, hood, door, one length of clay lined stack, muffle and muffle supports.

When ordering specify voltage, phase and cycle of your current and the type and B. t. u. content of the gas.

Prices as shown are for domestic packing. When furnaces are to be packed for ocean shipment add 5%.

Note: These furnaces are also furnished with high pressure inspirator when gas is available at a pressure of 10 pounds or more. Prices on application.

					Furnaces With Clay Muffles & Supports			**Furnaces With Silcar Muffles & Supports**		
Muffle Letter	Number of Muffles	Inside Muffle Dimensions	Capacity 20-Gram Crucibles	Floor Space Inches	Catalog Number	Shipping Weight Pounds	**Each**	Catalog Number	Shipping Weight Pounds	**Each**
GK	Single	7x11½x4¼	6	23x21	**180M1**	1015	**$275.00**	**180M10**	1065	**$284.10**
	Double	7x11½x4¼	12	54x21	**180M2**	1785	**460.00**	**180M11**	1835	**478.20**
	Triple	7x11½x4¼	18	81x21	**180M3**	2520	**670.00**	**180M12**	2570	**697.30**
GI	Single	8¾x15¼x4¼	12	24x25	**180M4**	1230	**310.00**	**180M13**	1280	**325.80**
	Double	8¾x15¼x4¼	24	58x25	**180M5**	2215	**555.00**	**180M14**	2265	**586.60**
	Triple	8¾x15¼x4¼	36	87x25	**180M6**	3155	**775.00**	**180M15**	3205	**822.40**
GU	Single	12½x17x5¼	20	28x26	**180M7**	1375	**325.00**	**180M16**	1425	**344.00**
	Double	12½x17x5¼	40	63x26	**180M8**	2496	**580.00**	**180M17**	2546	**618.00**
	Triple	12½x17x5¼	60	99x26	**180M9**	3600	**850.00**	**180M18**	3650	**907.00**

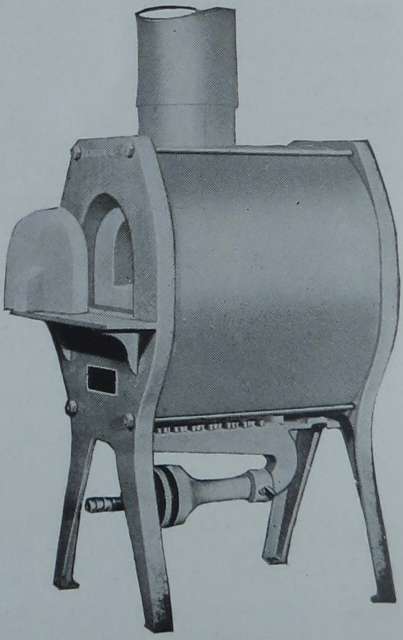
Replacement Parts

		Muffle Protector Plate		**Muffle Flue**		**Muffle Stools***	
Number	Material	Part No.	**Each**	Part No.	**Each**	Part No.	**Each**
180M19	Clay	GK 10	**$1.00**	GK 13	**$ .40**	GK 17	**$ .20**
180M20	Clay	GI 10	**1.00**	GI 13	**.40**	GI 17	**.20**
180M21	Clay	GU 10	**1.80**	GU 13	**.40**	GU 17	**.20**
180M22	Silcar	GK 10S	**2.65**	GK 13S	**2.85**	GK 17S	**.90**
180M23	Silcar	GI 10S	**4.15**	GI 13S	**2.85**	GI 17S	**.90**
180M24	Silcar	GU 10S	**5.00**	GU 13S	**2.85**	GU 17S	**.90**

*Muffle units GK require four stools; GI and GU require six stools.

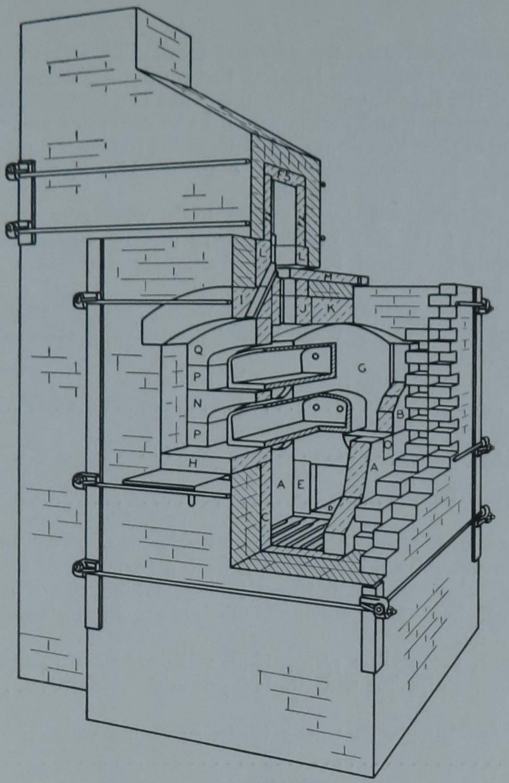
180M25 Furnaces, Laboratory, Weisnegg. For laboratories and those desiring a small, inexpensive furnace capable of attaining high temperatures. Develops a temperature of 1500° F. in twenty minutes, and capable of 2200° F., with 850 B. t. u. gas. Well insulated and lined with high quality refractory clay. Burner operates at atmospheric pressure and is controlled by one valve and one air shutter. Complete with full equipment for operation including body, burner, muffle, muffle door, and one 24-inch length of clay lined stack. No blower required.

Muffle letter	**S-10**	**FF**
Muffle dimensions, inches	4x6½x2½	6x10x4
Space required	10x13	12½x17½
Diameter of flue pipe, inches	4	5
Fuel consumption, B. t. u. per hour	50,000	85,000
Weight, shipping, pounds	113	185
Each	**$30.00**	**40.00**

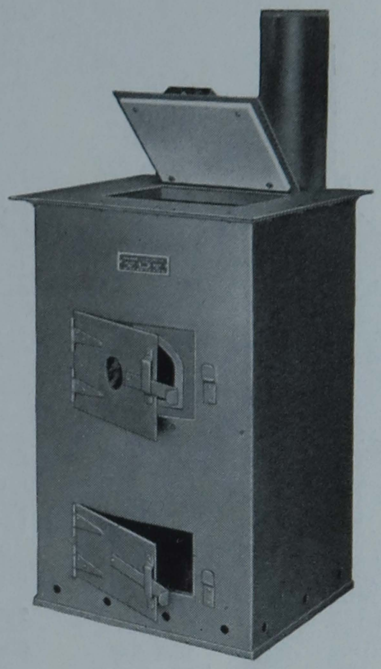


180M25

Furnaces, Assay, Continued



181M2



181M4

Furnaces, Assay Muffle, Coal Fired. Standard firing of the one and two-muffle furnace is from the rear; the three-muffle furnace is fired from the right side of the muffle opening.

The furnace as supplied consists of all the special fire clay tile, clay muffles, necessary fire clay for setting up, and all the iron parts including grate bars, grate bar supports, iron shelf, brackets, angle iron, binding rods, fire box and ashpit doors, which are all the parts needed except the red brick jacket and stack.

Construction is such that a brick mason can easily install them from the blue prints furnished with the parts.

	Inside Muffle Dimensions Inches	Floor Space Required Feet	Gross Weight Pounds	Each
181M1 Single QQ Muffle Furnace	11x18x6¼	3¾x4	2200	**$105.00**
181M2 Double QQ Muffle Furnace	11x18x6¼	3¾x4	2500	**125.00**
181M3 Triple QQ Muffle Furnace	11x18x6¼	4½x3¾	2700	**135.00**

Note: 181M1 furnace requires approximately 950 red brick for jacket; 181M2, 1000; and 181M3, 1150. When ordering parts, order by letter as shown in illustration.

181M4 Furnaces, Assay, Brown's, Coke or Charcoal Fired. Furnace is constructed of heavy sheet iron lined with fire clay tile. Doors are lined with asbestos. In addition to utilizing the muffle space, fusions may be carried out on top of the muffle by working through the top feed door.

Uses LL muffle having inside dimensions of 7½x14¼x4½ inches. Overall dimensions of furnace, 33x22x19 inches.

Shipping weight, 310 pounds.

Complete with muffle. **Each** **$65.00**

For muffles for above furnaces, see pages 275 and 276.

For ocean shipment packing of above furnaces add 10%.

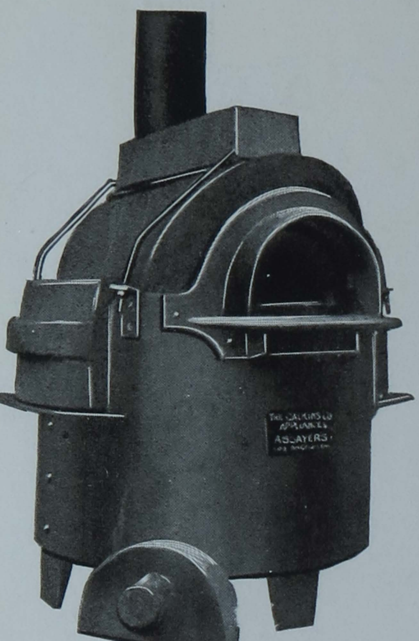
181M5

181M5 Furnace Grate Bars. Made of special cast iron. When estimating number required for fire box, figure each bar as 2½ inches wide.

Length, inches	12½	14	16	18	20	22	24*	25	27	30
Each	**$ .50**	**.60**	**.70**	**.85**	**.85**	**1.00**	**1.10**	**1.20**	**1.30**	**1.40**

*Length required for 181M1, 181M2 and 181M3 Coal Fired Furnaces.

Furnaces, Assay, Continued



182M1

182M1 Furnaces, Assay, Combination, Gasoline Fired. Consists of a circular firing chamber for the crucibles over which is located the muffle for cupellation. The burner opening is at the back of the furnace and placed so that the flame strikes the inside of the firing chamber on a tangent and swirls around the crucibles and up to and around the muffle. The firing chamber has doors on both sides for easy access. Muffle draft is provided by a simple flue arrangement and is controlled by moving the muffle door. Flat casting on top can be used as a hot plate.

Firing chamber is 12 inches in diameter by 6 inches high, with a capacity of ten 20-gram crucibles. Equipped with a CJ clay muffle 4x6x12 inches, with a capacity of eighteen 1½-inch cupels. Overall height of furnace, 21 inches; diameter, 16 inches. Uses about ¾ gallons fuel per hour.

Complete with gasoline burner, five-gallon pump tank with pressure gauge, connecting pipe and length of stack pipe. Shipping weight, 290 pounds. **Each**......$92.00

182M2 Furnace, Only. Without burner or pump tank. Shipping weight, 180 pounds. **Each**......$46.50

182M3 Furnace Doors. Set of two......$ 2.50

182M4 Furnace Muffle Doors. Each......$ .60

182M5 Furnaces, Assay, Combination, Gasoline Fired. Similar to 182M1, but firing chamber is 8 inches in diameter by 6 inches high, with a capacity of five 20-gram crucibles. Equipped with a CC clay muffle 3x4¾x8 inches, which has a capacity of twelve 1½-inch cupels. Overall height of furnace, 20 inches; diameter, 14 inches. Uses about ½ gallon fuel per hour.

Complete with gasoline burner, two-gallon pump tank with pressure gauge, connecting pipe and length of stack pipe. Shipping weight, 170 pounds. **Each**......$62.00

182M6 Furnace, Only. Without burner or pump tank. Shipping weight, 85 pounds. **Each**......$33.00

182M7 Furnace Doors. Set of two......$1.90

182M8 Furnace Muffle Doors. Each......$ .50

182M9 Furnaces, Assay, Combination, Gasoline Fired, Braun. Consists of a firing chamber for the crucibles over which is located the muffle for cupellation. The burner opening is at the back of the furnace and placed so that the flame is forced toward the opposite wall where it is deflected by a special tile to both sides of the chamber and upwards around the muffle.

The firing chamber has doors on both sides for easy access. Muffle draft is regulated by the muffle door.

The firing chamber has a capacity of ten 20-gram crucibles. Furnace is equipped with an S627-2 clay muffle, outside dimentions: 4x6x10 inches. Burner uses about ¾ gallon fuel per hour.

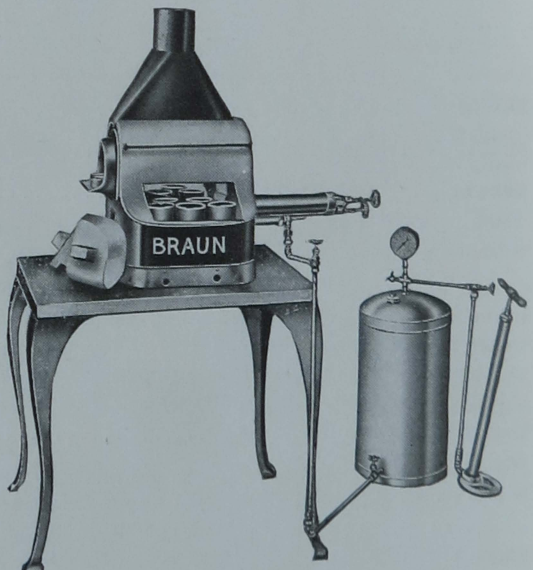
Complete with 2-inch Cary burner, pump tank with pressure gauge, 12 feet of ¼-inch iron pipe, two swivel joints, valves, fittings, and two lengths of stack pipe but without stand. Weight, 290 pounds. **Each**......$94.00

182M10 Furnaces, Only. Without burner or pump tank. Weight, 235 pounds. **Each**......$46.00

182M11 Stands, Only. Each......$18.00

182M12 Furnace Doors. Set of two......$ 3.50

182M13 Muffle Doors. Each......$ .70



182M9

182M14 Furnaces, Assay, Combination, Gasoline Fired. Braun. Similar to 182M9, except firing chamber has a capacity of six 20-gram crucibles. Equipped with an S627-10 clay muffle, outside dimensions: 3x4¾x8 inches. Burner uses about ½ gallon fuel per hour.

Complete with 1½-inch Cary burner, pump tank with pressure gauge, two swivel joints, valves, fittings and two lengths of stack pipe, but without stand. Shipping weight, 170 pounds. **Each**......$73.50

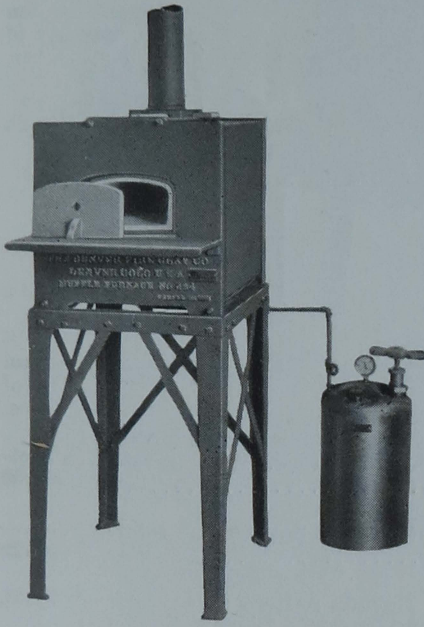
182M15 Furnaces, Only. Without burner or pump tank. Shipping weight, 115 pounds. **Each**......$28.00

182M16 Stands, Only. Each......$18.00

182M17 Furnace Doors. Set of two......$ 2.00

182M18 Furnace Muffle Doors. Each......$ .55

Furnaces, Assay, Continued



183M1

183M1 Furnaces, Assay Muffle, Gasoline Fired. Equipped with muffles of sufficient size to permit fusions or cupellations within the muffle. Muffle is supported by muffle protectors and stools designed for maximum support and uniform heating. The burner is located at the rear of the furnace.

Complete with clay muffle, burner, pump tank with pressure gauge, set of pipe and fittings, one length of clay-lined stack and stand.

Muffle Letter	**LC**	**LD**	**LE**
Dimensions, muffle, outside, inches	5½x8½x12	6x10¾x16	7x15x18
Capacity, muffle, 20-gram crucibles	8	15	20
Floor space of furnace, inches	19¼x20¼	23x24	27½x27¼
Size, gasoline tank, gallons	10	10	10
Weight, shipping, pounds	570	720	885
Each	**$130.00**	**150.00**	**165.00**

Parts

183M2 Dampers, Small. One required. **Each**	**$ .40**	**.40**	**.40**
183M3 Dampers, Large. One required. **Each**	**$ .40**	**.40**	**.50**
183M4 Plates, Bottom. Two required. **Each**	**$ .25**	**.30**	**.35**
183M5 Protectors, Muffle. Three required. **Each**	**$ .20**	**.25**	**.30**
183M6 Flues, Muffle. One required. **Each**	**$ .40**	**.50**	**.50**
183M7 Stools. Four required. **Each**	**$ .55**	**.65**	**.75**
183M8 Bosses, Burner. One required. **Each**	**$ .50**	**.50**	**.50**

183M9 Furnaces, Assay Muffle, Gasoline Fired. Similar to 183M1, except equipped with a GF muffle, outside dimensions, 4½x6x10 inches, with a capacity of six 10-gram crucibles.

The muffle requires no supports or stools.

Complete with clay muffle, burner, 5-gallon pump tank, and set of pipe and fittings, but without stand or length of clay-lined stack. Shipping weight, 185 pounds.

Each **$65.00**

Parts

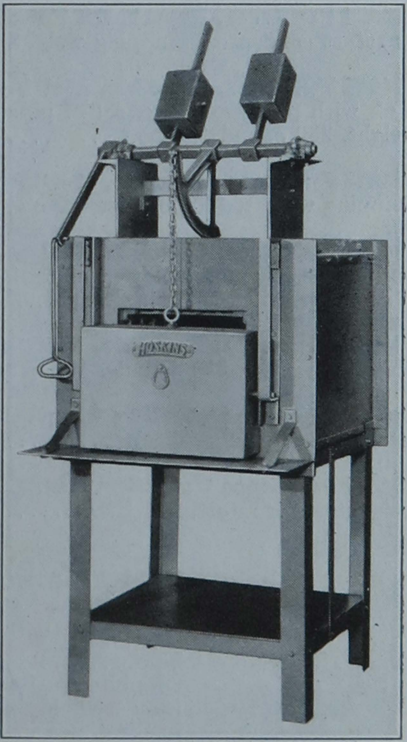
183M10 Flues, Muffle. One required. **Each**	**$ .35**
183M11 Bosses, Burner. One required. **Each**	**$ .50**

183M12 Furnaces, Assay Muffle, Electric. Especially designed to operate for long periods of time at the high temperatures necessary for assaying. The working chamber is formed of refractories with slotted backs in which the hair-pin heating elements are located. The hair-pin elements are of a heavy square cross section for long life and are easily replaced. The chamber is heated at both sides, top and bottom and has a 1½-inch vent hole in the rear. The door may be lowered to admit draft over the top for cupelling. Each furnace is supplied with a special metal alloy hearth plate to protect the bottom refractory and elements from spills.

A working temperature can be attained in about one and one-half hours. The maximum safe operating temperature is 2000° F. By leaving the furnace on low heat between charges, a working temperature can be reached quicker and the life of the elements and refractories prolonged. A pyrometer should be used as it is difficult to determine the temperature of an electric furnace by observation, and to assist in avoiding overheating which shortens the life of the elements. A controlling pyrometer such as used with 188M13 will eliminate the manual control of temperature and give automatic operation. Other indicating and controlling pyrometers are shown elsewhere in this catalog.

Operates on low voltage alternating current secured from a regulating transformer. Close temperature control is possible by selective switches.

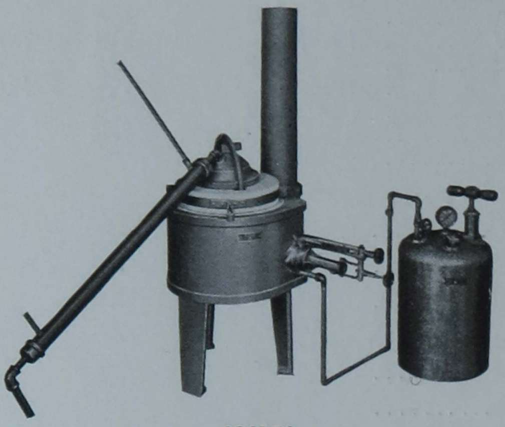
Furnace is complete with alloy hearth plate, stand, switchboard and transformer, for operation on 110, 220 or 440 volts, single or three phase, 60 cycle current, but without pyrometer.



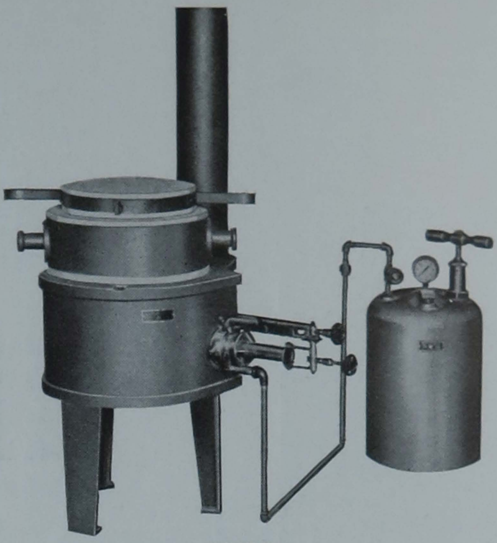
183M12

	Inside Chamber Dimensions Width x Length x Height Inches	Capacity in 20-Gram Crucibles	Maximum Current Requirements	Floor Space Inches	Shipping Weight Pounds	For Single Phase 60 Cycle Current **Each**	For Three Phase 60 Cycle Current **Each**
183M12	14x19x8	24	15 K. W.	36x36	2000	**$ 945.00**	**$1000.00**
183M13	14x26x8	32	20 K. W.	37x48	2300	**$1040.00**	**$1055.00**

Furnaces, Continued



184M1



184M5

184M1 Furnaces, Retort, Gasoline Fired. For 335M5 6-pint Nevada pattern iron retort. Complete with burner, 10-gallon pump tank with pressure gauge, set of pipe and fittings, and length of 5-inch diameter, clay-lined stack. Without retort or retort condenser. Shipping weight, 250 pounds. **Each**.................**$85.00**

184M2 Furnaces, Retort, Gasoline Fired. Similar to 184M1, except for 335M5 10-pint Nevada pattern iron retort. Without retort or retort condenser. Shipping weight, 450 pounds. **Each**.................**$95.00**

184M3 Furnaces, Retort, Oil Fired. With electric motor blower. For 335M5 6-pint Nevada pattern iron retort. Complete with burner, electric motor blower, oil tank, set of pipe and fittings for oil and air lines and length of 5-inch diameter, clay-lined stack. Without retort or retort condenser. Shipping weight, 350 pounds. When ordering specify current characteristics. **Each**.................**$175.00**

184M4 Furnaces, Retort, Oil Fired. Similar to 184M3, except for 335M5 10-pint Nevada pattern iron retort. Without retort or retort condenser. Shipping weight, 550 pounds. When ordering specify current characteristics. **Each**.............**$185.00**

184M5 Furnaces, Crucible, Melting, Gasoline Fired. For size 25 graphite crucible. Complete with burner, 10-gallon pump tank with pressure gauge, set of pipe and fittings, and length of 5-inch diameter, clay-lined stack. Without crucible. Shipping weight, 250 pounds. **Each**.................**$90.00**

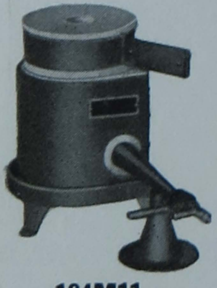
184M6 Furnaces, Crucible, Melting, Gasoline Fired. Similar to 184M5, except for size 45 graphite crucible. Without crucible. Shipping weight, 450 pounds. **Each**.................**$100.00**

184M7 Furnaces, Crucible, Melting, Oil Fired. With electric motor blower. For size 25 graphite crucible. Complete with burner, electric motor blower, oil tank, set of pipe and fittings for oil and air lines and length of 5-inch diameter clay-lined stack. Without crucible. Shipping weight, 350 pounds. When ordering specify current characteristics. **Each**................**$180.00**

184M8 Furnaces, Crucible, Melting, Oil Fired. Similar to 184M7, except for size 45 graphite crucible. Without crucible. Shipping weight, 550 pounds. When ordering specify current characteristics. **Each**.................**$190.00**

184M9 Furnace Retorting Rings. For adapting 184M5 and 184M7 melting furnaces to use 335M5 6-pint Nevada pattern iron retort for retorting. **Each**.................**$4.20**

184M10 Furnace Retorting Rings. For adapting 184M6 and 184M8 melting furnaces to use 335M5 10-pint Nevada pattern iron retort for retorting. **Each**.................**$5.25**



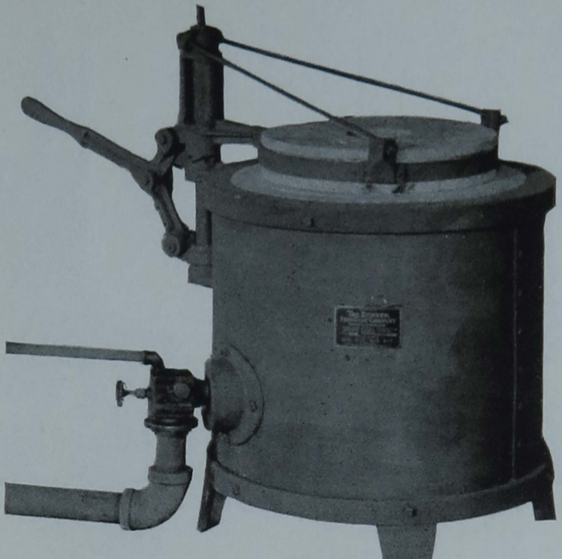
184M11

184M11 Furnaces, Crucible, Melting, Gas Fired. For graphite and clay crucibles. Require from three to five cubic feet of air per minute such as furnished by 35M10 blowers.

Complete with burner for gas and air, but without blower or crucible.

Size	**1**	**2**	**3**	**4**
Graphite crucible size	000	1	3	8
Clay crucible size	20 gram	G	J	O
Inside dimensions: diameter x depth, inches	3½x4¼	4¾x7¼	6x9	8⅜x11¾
Gas requirements: cubic feet per hour	70	70	125	125
Air requirements: cubic ft. per min. at 5 lbs. pressure	3	3	5	5
Shipping weight, pounds	10	27	55	95
Each	**$12.00**	**13.00**	**17.00**	**20.00**
184M12 Burners, Only. Each	**$6.50**	**6.50**	**7.50**	**7.50**

Furnaces, Continued



185M1

185M1 Furnaces, Crucible, Melting, Stationary, Oil Fired. With electric motor blower. For standard lip graphite or Tercod crucibles.

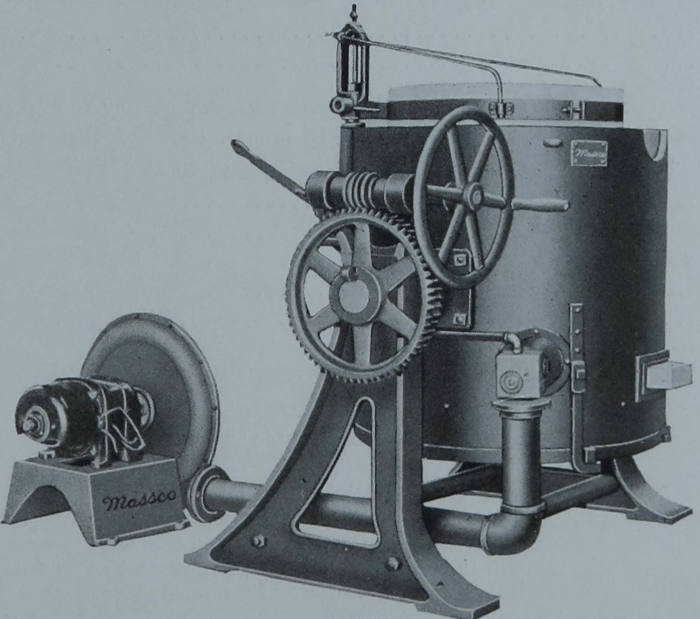
Complete with low pressure burner, low pressure high speed electric motor blower, oil tank, and set of pipe and fittings, but without crucible. When ordering specify current characteristics.

Size Crucible	**40**	**60**
Weight, shipping, pounds	1050	1350
Each	**$330.00**	**350.00**

185M2 Furnaces, Crucible, Melting, Stationary, Gas Fired. Similar to 185M1, except supplied with gas burner. Without crucible. When ordering specify current characteristics.

Size Crucible	**40**	**60**
Weight, shipping, pounds	1000	1250
Each	**$310.00**	**330.00**

185M3 Clay Linings, Inside Only. For 185M1 and 185M2 furnaces. **Set**	**$3.60**	**4.80**



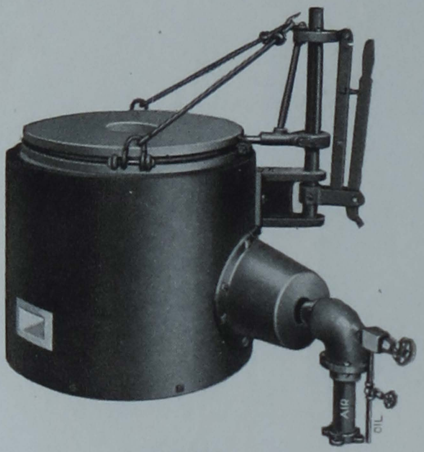
185M4

185M4 Furnaces, Crucible, Melting, Tilting, Oil Fired. With electric motor blower. For Tercod or graphite crucibles having Case type or extended type lips. Inside linings can be replaced easily. Equipped with drop bottom for use in event of a spill.

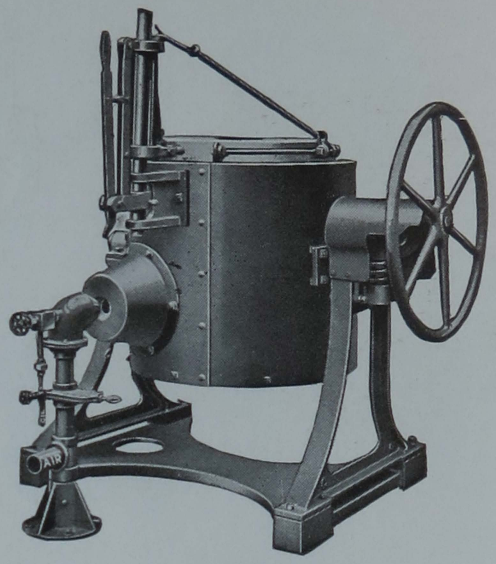
Complete with low pressure burner, low pressure high speed electric motor blower, oil tank, set of pipe and fittings for oil and air lines and graphite crucible. When ordering specify current characteristics.

Size crucible	**40**	**60**	**150**	**275**
Floor space, inches	36x36	36x40	40x52	40x54
Weight, shipping, pounds	2000	2300	2700	2950
Each	**$490.00**	**510.00**	**605.00**	**710.00**
185M5 Clay Linings, Inside. Set	**$3.60**	**4.80**	**7.20**	**12.00**
185M6 Clay Stools. Each	**$1.25**	**1.25**	**2.00**	**2.50**
185M7 Clay Wedges, Crucible. Set of four	**$ .20**	**.20**	**.20**	**.20**

Furnaces, Continued



186M1



186M3

186M1 Furnaces, Crucible, Melting, Stationary, Oil Fired, Monarch. For standard graphite or Tercod crucibles. Burner operates on an oil pressure of 15 pounds and an air pressure of 16 ounces.

Complete with burner, blower and crucible. When ordering specify current characteristics.

Size, crucible	**20**	**40**	**60**
Consumption, oil, gallons per hour	2¾	4¼	6½
Air requirements, forced draft, cubic feet per hour	3150	5050	7950
Weight, shipping, pounds	1300	1450	1600
Each	**$395.00**	**420.00**	**475.00**

186M2 Furnaces, Crucible, Melting, Stationary, Oil Fired, Monarch. Same as 186M1, except without blower.

Size, crucible	20	40	60
Each	**$225.00**	**250.00**	**275.00**

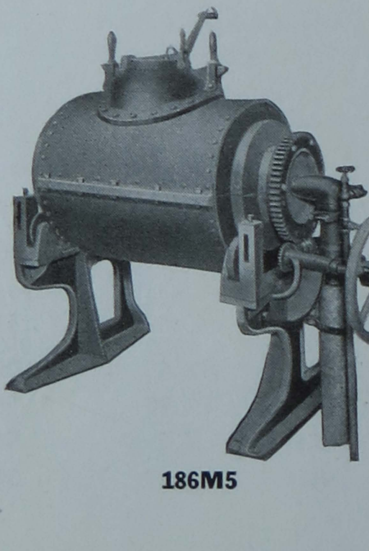
186M3 Furnaces, Crucible, Melting, Tilting, Oil Fired, Monarch. For graphite or Tercod crucibles. With extended lip Burner operates on an oil pressure of 15 pounds and air pressure of 16 ounces. Furnace is rotated for pouring by geared hand wheel.

Complete with burner, motor blower, and crucible. When ordering specify current characteristics.

Size, crucible	**125**	**150**	**275**	**400**
Consumption, oil, gallons per hour	10	12	16	18
Air requirements, forced draft, cubic feet per hour	12,000	14,400	19,200	21,600
Weight, shipping, pounds	2500	2600	2800	3000
Each	**$625.00**	**680.00**	**730.00**	**780.00**

186M4 Furnaces, Crucible, Melting, Tilting, Oil Fired, Monarch. Same as 186M3, except without motor blower.

Size, crucible	125	150	275	400
Each	**$425.00**	**450.00**	**500.00**	**550.00**



186M5

186M5 Furnaces, Melting, Oil Fired, Monarch. For the melting of brass, bronze, copper, aluminum, gray iron, ferro manganese, gold and silver precipitates.

Supplied with lining of fire clay tile but can be relined with clay tile, carborundum or any plastic lining. The shell is split lengthwise so that the upper half can be laid back for relining. Furnace is rotated for pouring by a geared hand wheel. Complete with burner, but without blower.

Size	**92**	**93**	**94**
Working capacity, pounds of metal	500	1000	2000
Pressure, air, ounces	12	12	12
Pressure, oil, pounds	5	5	5
Consumption, oil, gallons, per 100 pounds melted metal	2	2	2
Weight, shipping, pounds	5500	8400	12,300
Each	**$725.00**	**1100.00**	**1650.00**

Note: The quantity of fuel required will vary according to the kind of metal melted, the degree of heat required and the attention and promptness with which it is melted and poured.

Note: Air pressure and volume will vary according to the kind of fuel used and the character of metal melted. For a pressure of 12 ounces a fan blower of sufficient size for the volume required will maintain uniform pressures. A positive pressure blower is also satisfactory and may be used where higher air pressure is required.

Furnaces

187M1

187M1 Furnaces, Crucible, Electric, Hoskins Type FH. Operate on low voltage A. C. only, and suitable for continuous use at 2000° F. For melting small batches of metal, establishing the critical points of high carbon steel, determining melting points, etc.

The heating unit is a helical Chromel coil covered with a thin coat of refractory cement.

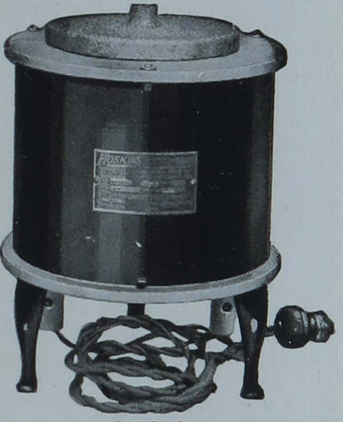
Type FH102 is provided with a refractory cover for the heating chamber.

Complete with transformer for supplying the low voltage, rheostat for temperature control, and connecting cords for operation on 60-cycle A. C. When ordering, specify voltage.

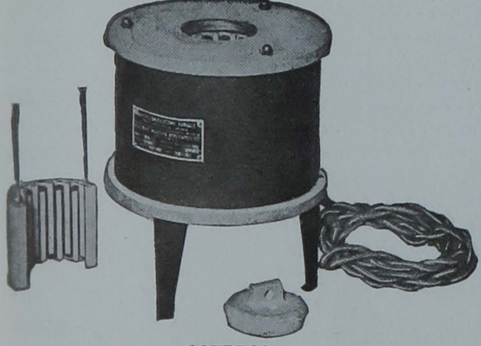
Type FH	**102**	**104**
Overall diameter x height, inches	7½x10⅛	12⅜x19
Heating chamber diameter x depth, inches	2x2½	4x4
Maximum watts	1000	1500
Each	**$82.75**	**126.00**
187M2 Furnace, Only. Specify voltage. **Each**	**$30.00**	**50.00**
187M3 Rheostat, Only. Specify voltage. **Each**	**$17.75**	**26.00**
187M4 Transformer, Only. Specify voltage. **Each**	**$35.00**	**50.00**
187M5 Heating Unit, Only. (One required.) Specify voltage. **Each**	**$3.50**	**8.00**

187M6 Furnaces, Crucible, Electric, Hoskins Type FD. Operates directly from the line, A. C. or D. C. and suitable for continuous operation at 1800° F. For melting small quantities of base metals, pyrometer calibration, etc. The heating unit consists of a refractory core wound with a helical coil of chromel wire. Complete with rheostat for temperature control. When ordering specify voltage.

Type FD	**101**	**104**
Overall diameter x height, inches	6¼x9¾	12⅜x13¾
Heating chamber, diameter x depth, inches	2x2½	5x5
Maximum watts	370	1200
Each	**$36.75**	**67.75**
187M7 Furnace, Only. Specify voltage. **Each**	**$23.00**	**50.00**
187M8 Rheostat, Only. Specify voltage. **Each**	**$13.75**	**17.75**
187M9 Heating Unit, Only. Complete. Specify voltage. **Each**	**$3.75**	**8.50**
187M10 Refractory, Only. 1 required. **Each**	**$2.00**	**4.00**
187M11 Coiled Wire, Only. 1 required. Specify voltage. **Each**	**$1.75**	**4.50**



187M6



187M12

187M12 Furnaces, Crucible, Electric Multiple Unit. Type 80, 110-Volt. For operation on 110 volt A. C. or D. C. only. Suitable for continuous use at 1832° F. or for short periods at 1950° F. For melting small quantities of base metals, pyrometer calibration, etc. The heating unit consists of wire coils wound on semicircular refractories. The use of a rheostat is recommended for temperature control and to avoid overheating. Heating chamber is 2⅜ inches in diameter by 2½ inches deep. Maximum watts, 390; shipping weight, 16 pounds. Without rheostat. **Each** **$25.00**

187M13 Rheostat, Only. Each	**$13.75**
187M14 Heating Unit, Only. 2 required. **Each**	**$ 2.50**
187M15 Refractory, Only. 2 required. **Each**	**$ 1.50**
187M16 Coiled Wire, Only. 2 required. **Each**	**$ 1.00**

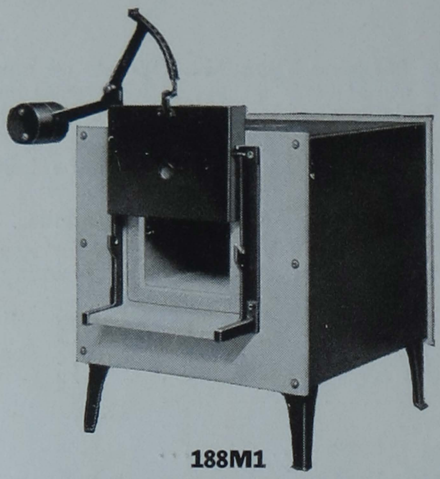
187M17 Furnaces, Crucible, Electric, Multiple Unit, Type 80, 220-Volt. Same as 187M12, except for operation on 220 volts A. C. or D. C. only. Equipped with rheostat, since the small wire diameter of the element and small chamber size require temperature control on 220-volt current. **Each** **$41.00**

187M18 Heating Unit, Only. 2 required. **Each**	**$ 2.50**
187M19 Refractory, Only. 2 required. **Each**	**$ 1.50**
187M20 Coiled Wire, Only. 2 required. **Each**	**$ 1.00**

187M21 Furnaces, Crucible, Electric, Multiple Unit, 110- and 220-Volt. Similar to 187M12, except heating units are selectively wound for operation on either 110 or 220 volts A. C. or D. C. Without rheostat.

Type	**82**	**84**	**86**
Overall diameter x height, inches	7¾x10	8¾x11	8¾x12½
Heating chamber, diameter x height, inches	2⅜x4	3x3½	3x5
Maximum watts	484	550	725
Weight, shipping, pounds	22	25	30
Each	**$30.00**	**37.50**	**45.00**
187M22 Rheostat, Only. Each	**$13.75**	**13.75**	**16.00**
187M23 Heating Unit, Only. 2 required. **Each**	**$ 3.25**	**3.75**	**4.25**
187M24 Refractory, Only. 2 required. **Each**	**$ 1.75**	**2.00**	**2.25**
187M25 Coiled Wire, Only. 2 required. **Each**	**$ 1.50**	**1.75**	**2.00**

Furnaces, Continued



188M1

188M8

Furnaces, Electric, Muffle, Hoskins, Type FH. For operation on A. C. only, requiring transformer, and suitable for continuous use at 2000° F. Hairpin shaped heating elements of Chromel wire fit into slots on all four sides of the muffle, and are replaced easily. The muffle is of one piece to insure cleanliness, and is replaceable. A quick acting, vertically moving door is provided with counterpoise, and a shelf is attached below the door to facilitate loading.

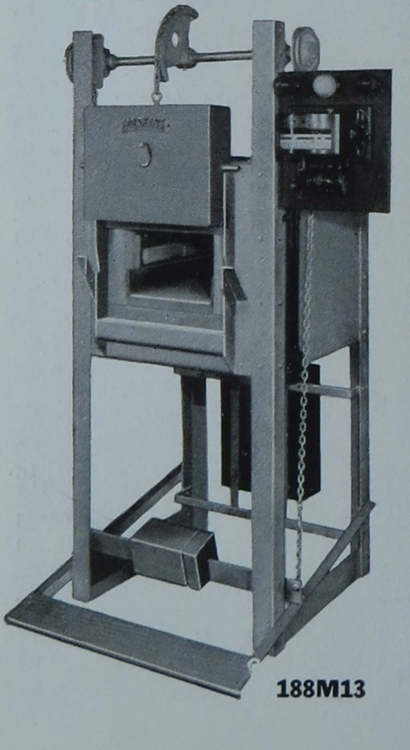
Type 202 Furnace is equipped with a fixed ratio transformer connected in series with a rheostat to provide temperature control.

Type 204 Furnace is equipped with a regulating transformer and switchboard which provides 31 steps of secondary voltage control from 1.4 to 44 volts.

Type FH	**202**	**204**
Muffle dimensions inside: length x width x height, inches	9x4¼x3	12½x7⅜x5
Overall dimensions: length x width x height, inches	18x16x22	22x23x29½
Maximum power consumption, kw	2	5
188M1 For 110 Volts, 60-Cycle, A. C. Each	**$171.00**	**315.00**
188M2 For 220 Volts, 60-Cycle, A C Each	**$171.00**	**315.00**
188M3 Furnace, Only. Without transformer. **Each**	**$ 95.00**	**145.00**
188M4 Transformer and Rheostat, Only. Specify voltage	**$ 76.00**	......
188M5 Transformer and Switchboard Assembly, Only. Specify voltage. **Each**	......	**170.00**
188M6 Heating Elements, Only. 10 required. **Each**	**$ 1.00**	**2.50**
188M7 Muffle, Only. Each	**$ 5.00**	**12.00**

Furnaces, Electric Muffle, Hoskins, Type FD. Operate directly from line current A. C. or D. C. and no transformer is required. Suitable for continuous operation at 1600° F. and intermittent operation at 1800° F. The heating element consists of a helical coil of Chromel wire wound in grooves on the outside of the one-piece muffle. Muffle and heating elements are replaced easily. The door is vertically moving and is provided with counterpoise. A shelf is attached below the door to facilitate loading. Complete with rheostat for temperature control.

Type FD	**202**	**204**
Muffle dimensions inside: length x width x height, inches	10x4¼x3	14x7½x5¼
Overall dimensions: length x width x height, inches	19½x16½x22	25x23x29
Maximum power consumption, kw	1.3	3.4
188M8 For 110 Volts, A. C. or D. C. Each	**$92.75**	**162.50**
188M9 For 220 Volts, A. C. or D. C. Each	**$92.75**	**162.50**
188M10 Furnace, Only. Specify voltage. **Each**	**$75.00**	**120.00**
188M11 Heating Element, Wire, Only. Specify voltage. **Each**	**$ 6.50**	**16.50**
188M12 Muffle, Only. Without wire element. **Each**	**$10.00**	**20.00**



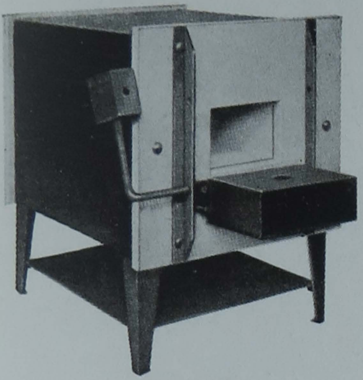
188M13

188M13 Furnaces, Electric Hoskins, Type FR. Of large capacity and for continuous use at 1850° F. Operate directly from the line at 220 volts A. C. or D. C. and no transformer is required. Heating elements are of Chromel ribbon, folded U-shape for large heating capacity, and slide easily into refractories on all four sides of the heating chamber. Terminals connect in series at rear of the furnace and are of large cross-section for coolness in operation. The Chromel floor plate is of one piece to facilitate sliding the work in and out, and affords protection to the floor heating units. Furnace and door are heavily insulated with the door over-lapping the opening on all sides and moving vertically by foot treadle which is adjustable for various heights of door opening.

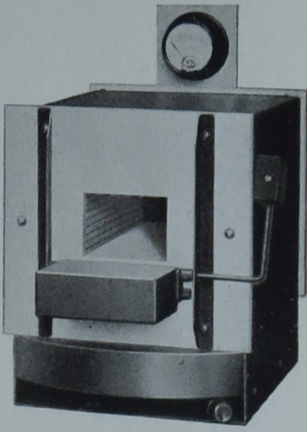
Temperature is regulated within 8° F. by an automatic temperature indicating and intermittent temperature controller operating every 5 seconds or 10 seconds as desired. Warning signal lamps also indicate temperature variations from the point to which the instrument is set. Complete with equipment as described above. For operation on 220 volts, 60-cycle A. C. or D. C.

Type FR	**206**	**207**	**208**
Dimensions inside: length x width x height, inches	17x12x8¾	26x12x8¾	35x12x8¾
Overall dimensions: length x width x height, inches	47x36x77	56x36x77	65x36x77
Maximum consumption, kw	13	16	19
Kw. to hold at 1500° F	3.2	4.1	5.0
Each	**$707.00**	**777.00**	**847.00**
188M14 Furnace, Only. Without automatic temperature controller. **Each**	**$430.00**	**500.00**	**570.00**
188M15 Wire Heating Elements, Only. 6 required. **Each**	**$6.25**	**15.00**	**16.00**

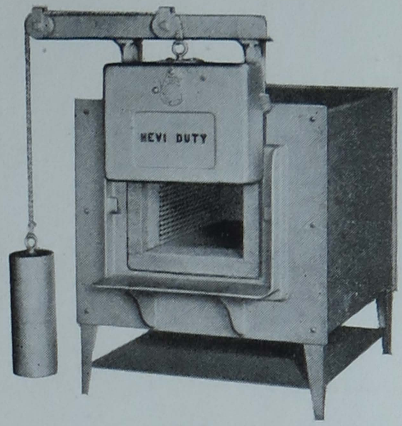
Furnaces, Continued



189M1



189M4



189M9

Furnaces, Electric Muffle, Multiple Unit. Suitable for continuous use at 1750° F. or intermittently at 1850° F. Heating units are of helical wire coils wound on four grooved refractory slabs and form the top, bottom and sides of the heating chamber. Top and bottom units are interchangeable; likewise the two side units. Heating units are reversible and allow a heating chamber with smooth faces or with grooved faces and heating wire exposed. Insulated door is of hinged type with counterpoise, so constructed that it can be hinged from either the top or bottom of the heating chamber. When hinged from the bottom the door provides a working shelf level with the floor of the chamber. Furnaces are provided with a pyrometer hole at the rear, and a small indicating pyrometer can be supplied for mounting directly on the furnace.

189M1 Furnaces without Rheostats. Operate directly from the line on either 110 or 220 volts A. C. or D. C. by means of selective connections at rear of furnace. The use of a rheostat is recommended to avoid overheating and prevent burnouts. Complete as described above, but without rheostat or pyrometer.

Type	**52**	**56**
Inside width x height x depth, inches	4¼x3x10	7½x5¼x14
Maximum watts	1440	3400
Each	**$75.00**	**120.00**
189M2 Rheostat, Only. Specify voltage. **Each**	**$17.75**	**42.50**
189M3 Pyrometer, Only. Each	**$30.00**	**30.00**

189M4 Furnaces with Built-In Rheostats. Provides convenient operating position and eliminates outside wiring. Will operate on only one voltage on account of rheostat. Complete as described above, but without pyrometer. For operation on the line, 110 volts A. C. or D. C.

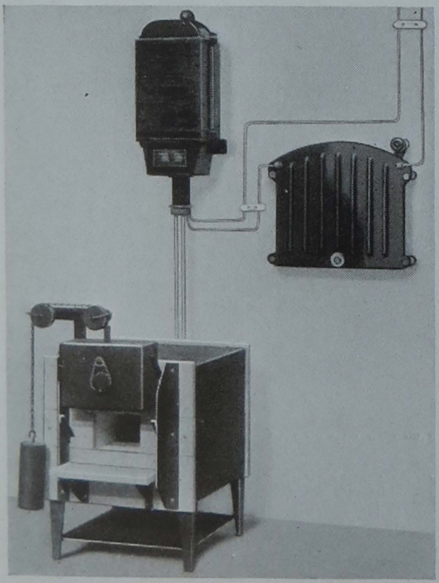
Type	**62**	**66**
Inside width x height x depth, inches	4¼x3x10	7½x5¼x14
Maximum watts	1440	3400
Each	**$102.50**	**172.50**
189M5 Furnaces. Same as 189M4, except for 220 v., A. C. or D. C. **Ea.**	**$102.50**	**172.50**
189M6 Pyrometer, Only. Each	**$30.00**	**30.00**

Renewal parts for above furnaces. When ordering specify serial number, type and voltage.

		Complete Heating Unit		**Refractory Only**		**Coiled Wire Only**	
		Top or Bottom	Side	Top or Bottom	Side	Top or Bottom	Side
Catalog No.	Type	**Each**	**Each**	**Each**	**Each**	**Each**	**Each**
189M7	52 or 62	**$5.00**	**$3.40**	**$3.00**	**$2.00**	**$2.00**	**$1.40**
189M8	56 or 66	**11.00**	**7.75**	**6.00**	**4.00**	**5.00**	**3.75**

Furnaces, Electric Muffle, High Temperature, Multiple Unit. Operate on 110 or 220 volts A. C. or D. C., and suitable for continuous use at 2350° F. Construction is similar to 189M1 furnaces, except elements are of special alloy to resist high temperature. Door is of cast iron, heavily insulated, and operates as illustrated. Temperature must be regulated to prevent overheating and burn-outs by rheostats or transformers and input controllers. When ordering, specify complete current characteristics.

Type	**5210**	**5410**	**5610**
Chamber length x width x height, inches	4½x3⅛x10½	5½x3⅞x12½	7⅞x5½x14⅝
Maximum watts	2000	3400	5000
189M9 Furnace, Only. Each	**$175.00**	**220.00**	**250.00**
189M10 Transformer. 110-v., 60-cy. **Ea.**	**$30.00**	**37.50**	**28.50**
189M11 Transformer. 220-volt, 60-cycle. **Ea.**	**$37.50**	**46.50**	**54.00**
189M12 Rheostat. Specify voltage. **Ea.**	**$22.00**	**42.50**	**52.50**
189M13 Input Controller. 110-volt. **Ea.**	**$51.00**	**66.00**	**89.00**
189M14 Input Controller. 220 volts. **Ea**	**$51.00**	**51.00**	**66.00**
189M15 Heating Unit. Top or bottom. **Ea.**	**$7.50**	**10.50**	**16.50**
189M16 Heating Unit. Side. **Each**	**$5.25**	**7.50**	**11.50**



189M17
Complete

Furnaces, Electric Muffle, Multiple Unit. Suitable for continuous use at 2000° F. Similar in construction to 189M1, except for operation on low voltage A. C. through a transformer. Type 92 is controlled by means of a rheostat and provides 20 steps of temperature control between 1000° F. and 2000° F. Type 96 is controlled by a transformer with switches giving 50 steps of temperature control between 500° F. and 2000° F. Specify current characteristics.

Type	**92**	**96**
Inside width x height x depth, inches	4x3x10	8x4¾x12
Maximum watts	1700	4300
189M17 Furnace, Only. Specify voltage. **Each**	**$100.00**	**145.00**
189M18 Rheostat, Only. Specify voltage. **Each**	**$ 22.00**	......
189M19 Transformer, Only. 60-cycle. Specify voltage. **Each**	**$ 52.50**	**170.00**
189M20 Pyrometer, Only. Each	**$ 30.00**	**30.00**
189M21 Heating Unit. Top or bottom. Specify voltage. **Each**	**$ 5.50**	**12.00**
189M22 Heating Unit. Side. Specify voltage. **Each**	**$ 4.25**	**9.00**
189M23 Refractory. Top or Bottom. Specify voltage. **Each**	**$ 2.00**	**3.50**
189M24 Refractory. Side. Specify voltage. **Each**	**$ 1.50**	**2.75**
189M25 Coiled Wire. Top or Bottom. Specify voltage. **Each**	**$ 3.50**	**8.50**
189M26 Coiled Wire. Side. Specify voltage. **Each**	**$ 2.75**	**6.25**

Furniture

We are prepared to supply quality furniture of the types as indicated below:

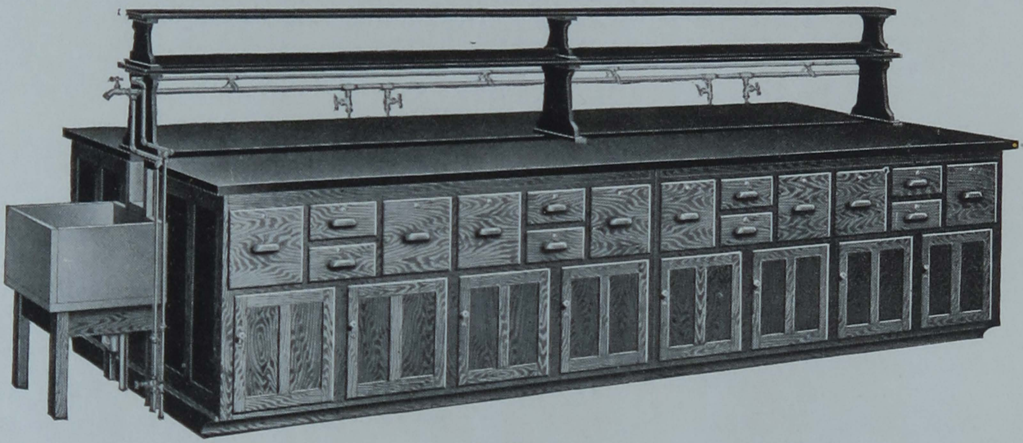
Educational Laboratory
Chemistry
Physics
General Science
Biology

Vocational Training
Bookkeeping
Typing
Home Economics
Art
Drafting
Manual Training

Industrial Laboratory
Clinical and Hospital Laboratory
Library
Classroom

Our representative will be pleased to call and submit suggested layouts, with complete architect's specifications and blueprints, without cost or obligation.

Write for separate catalog showing our complete line of furniture.



190M2

Laboratory Tables, Chemistry. For chemical work in educational and industrial laboratories. Arranged to accommodate sixteen students working in sections of eight.

Size—12 feet long x 4 feet wide x 3 feet high.

Top—1⅝ inches thick birch, matched, glued, dressed, and cleated to prevent warping.

Material and Construction—Table is made of selected oak, constructed with mortise and tenon joints, to stand hard service. Doors and drawers are made with lap fronts in order to exclude dust. Drawers are of tenon and groove construction, with maple sides, full framed in bottoms, and extension at back to safeguard against dropping when pulled out. Reagent shelves are made with retaining rims. Table is provided with toe space.

Drawers and Cupboards—Each student is provided with two drawers and one cupboard. Large drawers measure inside 8¼x9½x15 inches, small drawers measure inside, 3¼x9½x15 inches, and the cupboards measure inside, 19x16x17 inches. Each cupboard is equipped with one shelf.

Locks—When ordered with locks, drawers and doors are equipped with high grade master keyed locks in sets of three. The three locks are alike, but each set is different. Master key to pass all locks is furnished. Each set of locks is marked with a brass number plate.

Gutter and Sink—Gutter is lead lined, draining into sink at end of table, 5½ inches wide x 2 inches deep in the upper end, slanting down to 5 inches at the sink. Sink is soapstone, 10½ inches deep x 14x18 inches, equipped with special acid resisting lead waste plug and trap, and nickel plated overflow with bee-hive strainer.

Plumbing—Plumbing consists of four nickel plated compression water cocks with detachable hose nipples (by removing the hose nipple, a Richard's filter pump can be attached.) One nickel plated compression water cock threaded for regular ¾-inch hose connection, and eight nickel plated needle point gas cocks with galvanized iron piping to floor line. Exposed piping is aluminum bronzed. Each line is furnished with a shut-off valve near the floor.

Finish—Birch tops and reagent shelves are treated acid proof. Other exposed parts are finished antique (or any other shade when so ordered), with one coat of filler and three coats of varnish, rubbed. Inside of drawers and cupboards is varnished.

Shipping Weight—1900 pounds.

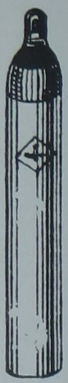
190M1 Laboratory Tables. Without locks. **Each**.. **$530.00**

190M2 Laboratory Tables. With 48 master-keyed locks. **Each**.................................... **$580.00**

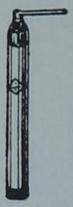
190M3 Fume Hoods. For school or industrial laboratories. Made of transite board, and can be fabricated to meet specifications. If dimensional sketch is furnished, transite can be supplied cut to size for assembly; or, if preferred, transite boards, stock sizes, 42x48 inches or 42x96 inches and thicknesses of ⅛, 3/16, ¼, ⅜ or ½ inch may be supplied for fabrication in the laboratory. Prices on application.

For further information on transite, see page 4.

Gases



Cylinders



***Lecture Bottle**

Gases, Laboratory. Supplied in convenient sized cylinders and lecture bottles.

Prices are F. O. B. factory.

Cylinders are sold outright or on deposit and if empties are returned prepaid and in good condition to point of shipment within 60 days, full refund will be made.

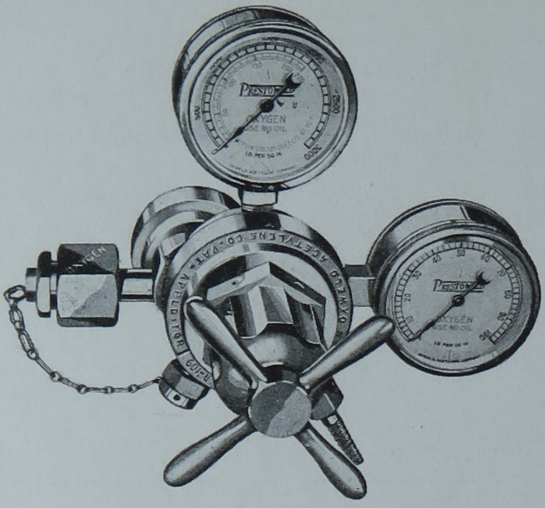
After 60 days a rental of $1.00 per month on No. 2 and larger, and 50c per month on No. 3 and smaller, will be charged. Lecture bottles are received for exchange or refilling only.

Cylinder number	**1A**	**1**	**2**	**3**	**4**	**5***
Diameter, inches	8½	8	5	4	4	2
Height, inches	51	51	51	25	12	12
Weight, pounds	135	110	65	20	11	3

Cat. No.	GASES	Press. Per Sq. In. 70° F	Per Cent. Purity	No. 1A				No. 1				No. 2			
				Lbs.	Cu. Ft.	Price	Refill	Lbs.	Cu. Ft.	Price	Refill	Lbs.	Cu. Ft.	Price	Refill
191M1	Ammonia (Anhy)	114	99%	100	(2310)	**$40.00**	$20.00	45	(1030)	**$29.90**	$9.90	17	(390)	**$23.50**	8.50
191M2	Butane (C. P.)	25	99%	.....	.....	.....	.....	35	(228)	**72.50**	52.50	17	(98)	**40.50**	25.50
191M3	Butylene	40	.....	.....	.....	.....	.....	35	(228)	**72.50**	52.50	17	(98)	**40.50**	25.50
191M4	Carbon Dioxide	800	99%	.....	.....	.....	.....	50	(438)	**26.00**	6.00	20	(175)	**19.00**	4.00
191M5	Chlorine	80	99.5%	150	(813)	**35.00**	15.00	100	(542)	**31.55**	11.55	40	(216)	**23.00**	8.00
191M6	Ethane	700	95%	.....	.....	.....	.....	(20)	248	**75.00**	50.00	(10)	124	**40.00**	25.00
191M7	Ethyl Chloride	35	99.5%	200	(1200)	**65.00**	50.00	50	(299)	**40.00**	20.00	25	(150)	**25.00**	10.00
191M8	Ethylene	1200	99%	.....	.....	.....	.....	25	(235)	**36.25**	16.25	9	(120)	**24.00**	9.00
191M9	Freon	70	.....	145	(435)	**87.50**	72.50	.....	.....	.....	.....	34	(102)	**32.68**	17.68
191M10	Helium	1600	98%	.....	.....	.....	.....	.....	150	**62.50**	37.50	.....	60	**36.00**	21.00
191M11	Hydrogen	1600	99.8%	.....	180	**35.00**	5.00	.....	140	**29.50**	4.50	.....	55	**19.00**	4.00
191M12	Hydrogen Sulphide	300	99.9%	125	(1387)	**100.00**	75.00	50	(555)	**52.50**	30.00	22	(222)	**28.20**	13.20
191M13	Isobutane	35	99%	110	(730)	**102.50**	82.50	35	(132)	**55.00**	35.00	15	(100)	**31.50**	16.50
191M14	Methane	900	92%	.....	.....	.....	.....	.....	125	**62.50**	37.50	.....	60	**36.00**	21.00
191M15	Methyl Chloride	58	99%	90	(686)	**56.00**	36.00	60	(457)	**39.00**	24.00	25	(190)	**27.50**	12.50
191M16	Nitrogen	1600	99.7%	.....	200	**35.00**	5.00	.....	150	**29.50**	4.50	.....	60	**19.00**	4.00
191M17	Nitrous Oxide	800	98%	.....	.....	.....	.....	50	(437)	**60.00**	35.00	20	(174)	**31.00**	16.00
191M18	Nickel Carbonyl	.....	Data	On	Appli	cation	.....	.....	.....	.....	.....	.....	.....	.....	.....
191M19	Oxygen	1600	99.8%	.....	200	**35.00**	5.00	.....	150	**29.50**	4.50	.....	60	**19.00**	4.00
191M20	Propane (C. P.)	115	99%	.....	.....	.....	.....	35	(297)	**63.75**	43.75	14	(120)	**32.50**	17.50
191M21	Propylene	130	95%	.....	.....	.....	.....	35	(321)	**72.50**	52.50	14	(126)	**36.00**	21.00
191M22	Sulphur Dioxide	45	99.5%	150	(750)	**44.00**	24.00	100	(500)	**37.00**	17.00	40	(200)	**23.40**	8.40

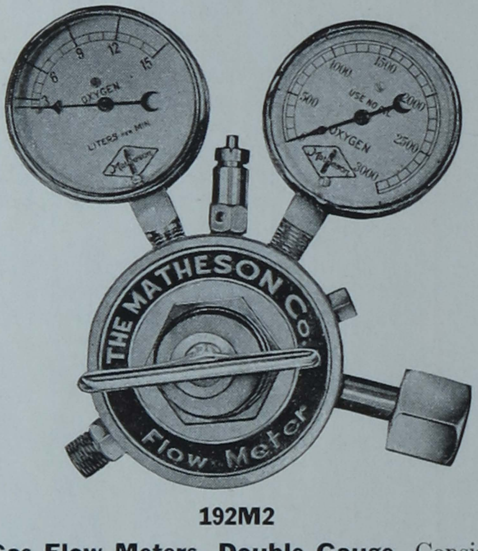
Cat. No. Cont.	GASES (Continued)	Press. Per Sq. In. 70° F	Per Cent. Purity	No. 3				No. 4				No. 5—Lecture Bottle			
				Lbs.	Cu. Ft.	Price	Refill	Lbs.	Cu. Ft.	Price	Refill	Lbs.	Cu. Ft.	Price	Refill
191M1	Ammonia (Anhy)	114	99%	5	(110)	**$15.75**	$3.75	2½	(50)	**$13.25**	$3.25	7 oz	(10)	**$6.50**	$1.50
191M2	Butane (C. P.)	25	99%	6	(39)	**21.00**	9.00	2	(13)	**13.60**	3.60	6 oz	(2)	**7.50**	2.50
191M3	Butylene	40	.....	7	(45)	**22.50**	10.50	2	(13)	**13.60**	3.60	6 oz	(2)	**7.50**	2.50
191M4	Carbon Dioxide	800	99%	6	(53)	**15.00**	3.00	2½	(22)	**12.00**	2.00	½	(4)	**6.00**	1.00
191M5	Chlorine	80	99.5%	15	(81)	**17.00**	5.00	5	(27)	**13.00**	3.00	1	(5)	**6.50**	1.50
191M6	Ethane	700	95%	(3)	37	**21.00**	9.00	(1¼)	16	**15.00**	5.00	(4 oz)	4	**6.50**	1.50
191M7	Ethyl Choride	35	99.5%	10	(60)	**17.00**	5.00	3½	(21)	**12.60**	2.60	½	(3)	**6.50**	1.50
191M8	Ethylene	1200	99%	3	(40)	**15.75**	3.75	1½	(20)	**12.25**	2.25	4 oz	(3)	**6.50**	1.50
191M9	Freon	70	.....	15	(45)	**21.00**	9.00	5	(15)	**13.50**	3.50	¾	(2)	**6.50**	1.50
191M10	Helium	1600	98%	.....	17	**18.80**	6.80	.....	8	**14.00**	4.00	.....	2	**6.50**	1.50
191M11	Hydrogen	1600	99.8%	.....	15	**14.50**	2.50	.....	6	**12.00**	2.00	.....	2	**6.00**	1.00
191M12	Hydrogen Sulphide	300	99.9%	9	(100)	**21.00**	9.00	3	(33)	**14.00**	4.00	½	(6)	**6.50**	1.50
191M13	Isobutane	35	99%	5	(33)	**18.25**	6.25	2	(13)	**13.00**	3.00	6 oz	(2)	**6.50**	1.50
191M14	Methane	900	92%	.....	18	**20.00**	8.00	.....	8	**14.00**	4.00	.....	1½	**6.50**	1.50
191M15	Methyl Chloride	58	99%	6	(45)	**16.08**	4.08	3	(23)	**12.40**	2.40	½	(4)	**6.50**	1.50
191M16	Nitrogen	1600	99.7%	.....	17	**14.50**	2.50	.....	8	**12.00**	2.00	.....	2	**6.00**	1.00
191M17	Nitrous Oxide	800	98%	6	(52)	**17.40**	5.40	3	(26)	**13.00**	3.00	½	(4)	**6.50**	1.50
191M18	Nickel Carbonyl	.....	Data	On	Appli	cation	.....	.....	.....	.....	.....	.....	.....	.....	.....
191M19	Oxygen	1600	99.8%	.....	17	**14.50**	2.50	.....	8	**12.00**	2.00	.....	2	**6.00**	1.00
191M20	Propane (C. P.)	115	99%	5	(42)	**19.50**	7.50	2	(17)	**13.50**	3.50	5 oz	(2)	**7.50**	2.50
191M21	Propylene	130	95%	5	(45)	**20.75**	8.75	2	(18)	**14.00**	4.00	5 oz	(3)	**7.50**	2.50
191M22	Sulphur Dioxide	45	99.5%	10	(50)	**15.00**	3.00	5	(25)	**12.00**	2.00	1	(5)	**6.50**	1.50

Gas Apparatus



192M1

192M1 Gas Regulators, Two-Stage Oxygen. With two stages of pressure reduction accomplished through the medium of two separate valves of the stem type, each with its own diaphragm. In the first stage, the pressure is reduced from cylinder pressure down to 150 pounds or 200 pounds. In the second stage, the pressure is reduced from the first-stage pressure to any working pressure desired and set by the operator. Instead of carrying the full cylinder pressure, the second stage is required to regulate pressures within only a comparatively narrow range. Is fitted with a 100-pound and 3000-pound gauge, each 2½ inches in diameter. **Each** . **$24.00**

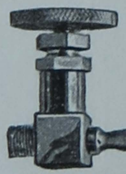


192M2

192M2 Gas Flow Meters, Double Gauge. Consists of an indicating pressure gauge and flow meter. Will maintain a steady flow of gas and indicate the flow in liters per minute; and with a stop watch, the flow in milliliters being withdrawn is immediately determined. It is very delicate and should be handled carefully. For oxygen only. **Each** **$29.50**

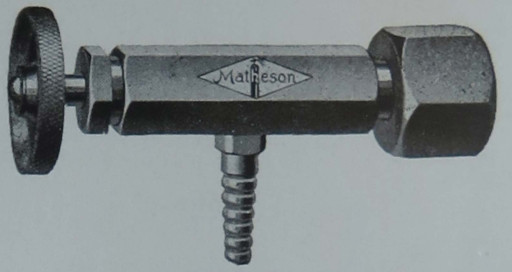
192M3 Gas Flow Meters, Single Gauge. Same as 192M2, except without pressure gauge. **Each** **$22.50**

Note: 192M2 and 192M3 also furnished for other gases or calibrated in cubic feet per hour, cubic meters per hour, etc., as specified. Prices on request.



192M4

192M4 Gas Valves, Auxiliary Needle. For use with lecture bottles. **Each** **$1.50**



192M5

192M5 Gas Controls, Non-Automatic Needle Valve. For gas cylinders. The body is all brass, nickel-plated. The needle is made of Monel metal. Used for bubbling gases to the atmosphere. For use with oxygen, nitrogen, hydrogen, carbon dioxide and hydrogen sulphide. **Each** **$4.50**

192M6 Gas Controls, Non-Automatic. Same as 192M5, except made of cold rolled steel for ammonia, chlorine and sulphur dioxide. **Each** **$6.50**

192M7

192M8

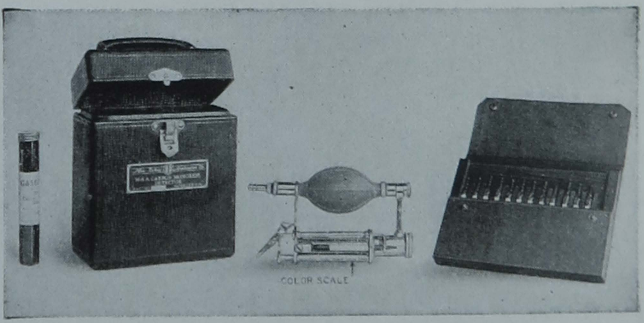
192M7 Gas Spreaders, Absorption. Breaks flow into minute bubbles insuring rapid absorption.

Size	1	2	3	4
Overall, inches	12	18	24	24
Thimble size, inches	¼x1⅛	11/16x2	¾x6	1 3/16x5
Each	**$1.50**	**2.00**	**2.50**	**3.50**

192M8 Gas Bags, Rubber. For sampling and storage of gases.

Capacity gallons	1	2	3
Overall, inches	16⅞x11	17½x12	21½x14½
Each	**$6.00**	**6.50**	**7.00**

192M9 Gas Stopcocks, Brass. For 192M8. **Each** . . . **$1.00**

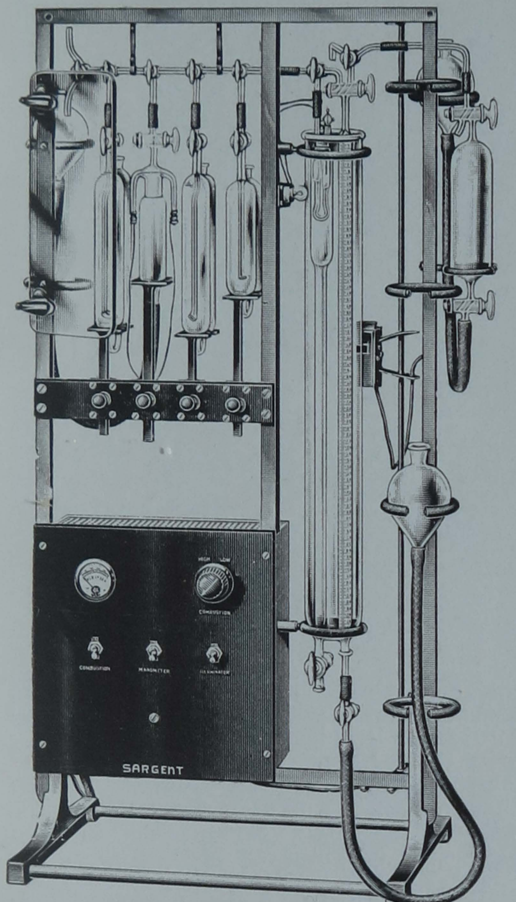


192M10

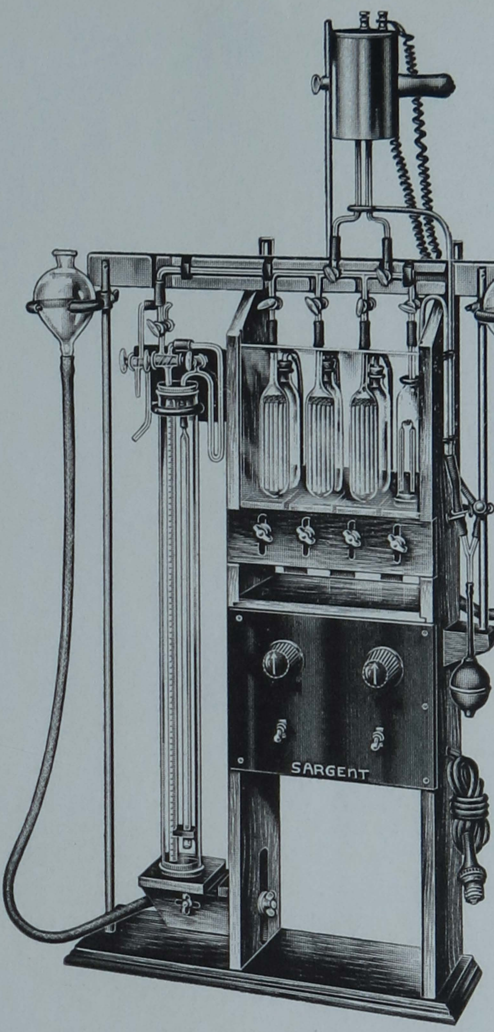
192M10 Gas Detectors, Carbon Monoxide. Quickly determines the presence of dangerous concentrations of carbon monoxide in air. Small, convenient to carry, simple to operate, and detects varying concentrations of the gas as low as .05%. Has been subjected to rigid tests by the U. S. Bureau of Mines, and is used extensively wherever the gas may exist or be produced in dangerous amounts. **Each** **$30.00**

192M11 Gas Detector Tubes, Carbon Monoxide.
Package of 12 . . . . **$3.84**

Gas Analysis



193M1



193M2

193M1 Gas Analyzers, Fuel Gas, Pyrex, Sargent, Shepherd, N. B. S. Represents modifications and perfections of the Orsat principle. Offers a high degree of precision in the determination of carbon dioxide, oxygen, carbon monoxide, methane, acetylene, ethylene, ethane, propane, hydrogen and nitrogen. All glass parts including the three leveling bulbs are made of Pyrex.

Burette is graduated in accordance with National Bureau of Standards specifications, and is provided with one three-way master stopcock communicating with a three-way manifold and burette compensator stopcock, and with a three-way admission stopcock to which the sampling tube is connected. The manometer and compensator are constructed as one unit and communicate with atmosphere by the rotation of a ground-on dome in which the platinum needle is sealed. Pipettes are of an efficient bubbling type and include one each for potassium hydroxide, alkaline pyrogallate and a third for nitrogen storage or for optional reagents for particular constituents. The fourth pipette provided is a combustion pipette designed with removable and easily replaceable filament with metal terminals cemented to two capillary side arms.

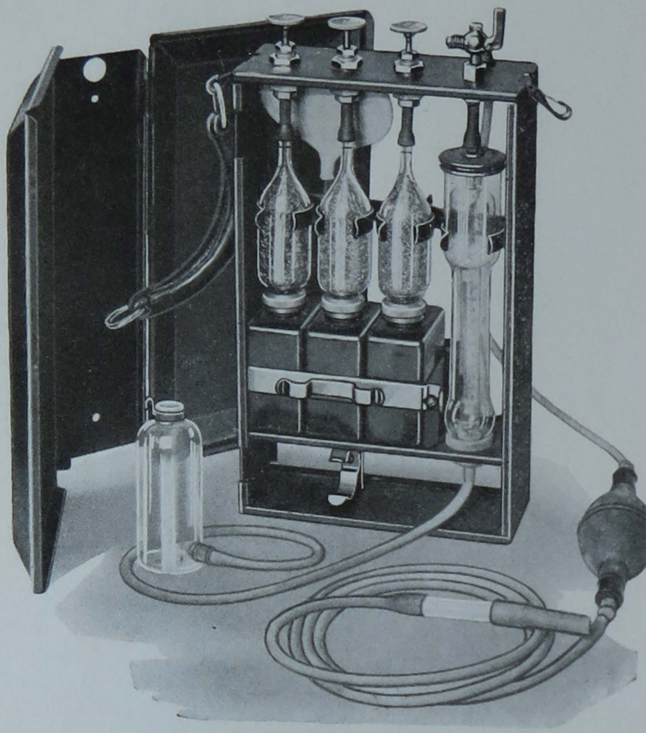
A gas collector with three-way stopcocks at either end and a capacity of 220 ml. is connected to the burette and supported in a suitable clamp on the frame. Current for the combustion pipette, illuminator and manometer balance indicator is supplied from a single 110-volt standard outlet, the former controlled through a regulating rheostat and measured by means of a Weston thermo ammeter. Meter, rheostat and control switches are mounted on a Bakelite instrument panel. Entire assembly is made on a rigid all-metal frame with metal base and provided with a shatter-proof glass swinging shield for protection in operating the combustion pipette.

Complete, including four pipettes, three 250-ml. leveling bulbs, sampling tube, rubber connections, rheostat, ammeter, illuminating device and connecting cord and plug for attachment to standard outlets. For operation from 110-volt A. C. or D. C. circuits. **Each** **$250.00**

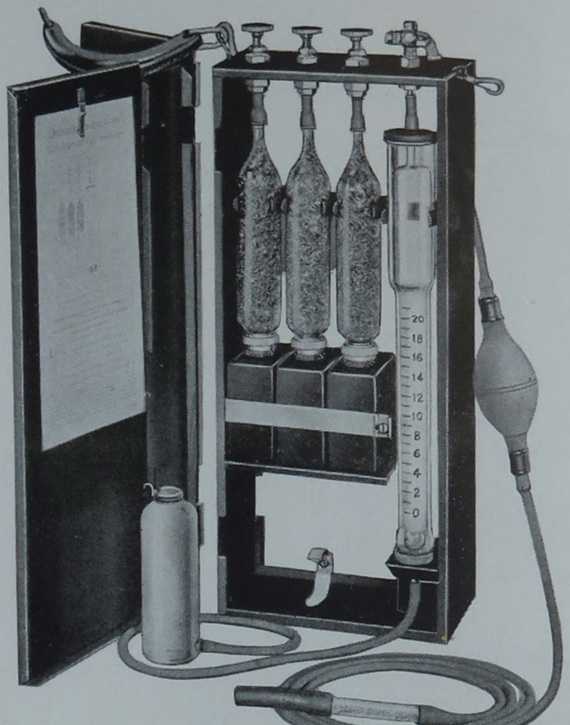
193M2 Gas Analyzers, Fuel and Mine Gas, Sargent, U. S. B. of M. An efficient model of the standard Bureau of Mines unit which employs three absorption pipettes, a slow combustion pipette and a copper oxide tube for the differential determination of hydrogen and carbon monoxide; and permits determinations of hydrogen, carbon monoxide, carbon dioxide, oxygen, methane, ethane, unsaturated hydrocarbons and illuminants.

The slow combustion pipette is made of Pyrex glass; is equipped with a platinum heating spiral; and is controlled by mercury in an independent leveling bulb. The burette is equipped with two three-way stopcocks. Graduated from the upper stopcock downward to 100 ml. in intervals of 0.1 ml.; entirely enclosed in a water jacket together with a compensating burette with external manometer for elimination of temperature and pressure variables. The copper oxide tube is equipped with an electric furnace producing a temperature of 300° C. Operating temperature of this furnace is controlled by a rheostat. A Bakelite control panel includes snap switches for both copper oxide furnace and slow combustion pipette and independent rheostat control knobs for each circuit. The pipette compartment is entirely protected by a removable plate of heavy, clear Duplex safety glass. For operation from 110-volt A. C. or D. C. circuits. **Each** **$150.00**

Gas Analyzers



194M1



194M8

194M1 Gas Analyzers, Orsat, Hays, "Engineer's Model," CO_2, CO, O_2. CO_2 reading in less than 30 seconds. Complete analysis for carbon dioxide, carbon monoxide and oxygen in 3 to 4 minutes.

Metal wool filled absorption pipettes prevent formation of bubbles, present large exposed wet surface for rapid absorption and keep solutions thoroughly mixed.

Uses a 50-cubic centimeter gas sample, handling it conveniently, quickly, and with an accuracy well within practical limits. Readings can be taken on burette to half divisions or 0.1%. The scale length of burette is $3\frac{3}{8}$ inches. A blue stripe behind the scale accentuates the water level and facilitates accurate reading.

The case is of corrosion-resisting steel, spot-welded. Green or black duco finish. The leather carrying handle is attached by snaps and may be swung out of the way. Both doors are hinged to a plate and may be removed during use if desired.

Case can be carried in any position without danger of spilling or mixing the chemical solutions.

Case size: 15x$7\frac{7}{8}$x5 inches.

Weight, completely charged, 8 pounds.

Complete $48.00

Accessories for 194M1

194M2 Measuring Burettes. With water jacket and rubber stoppers. **Each** $8.00

194M3 Measuring Burettes, Only. Each $5.00

194M4 Water Jackets, Only. Each $2.00

194M5 Absorption Pipettes for CO_2. Each $2.25

194M6 Absorption Pipettes for CO. Each $2.35

194M7 Absorption Pipettes for O_2. Each $2.25

194M8 Gas Analyzers, Hays, "Chemist's Model," CO_2, CO, O_2. A rugged portable analyzer which can be used in the laboratory or carried into the plant or field to make tests.

Burette capacity is for 100-cubic centimeter gas samples with temperature control by water jacket. Burette regularly supplied has a range of 0-21% with a division for each .2%, but any desired scale range can be furnished. Length of etched scale, $5\frac{3}{4}$ inches. Readings can be taken to quarter divisions or .05%.

A rubber aspirator bulb serves as a gas pump; the rubber tubing is fitted with soot filter.

Metal needle valves using stems of Monel metal and renewable seats of pure nickel give a micrometer control to the gas flow. These needle valves are ground in and use keeps them tight without the aid of stopcock grease.

Heavy, rugged, one-piece, moulded glass, absorption pipettes, held by spring clips, give unobstructed visibility.

Proper absorbing chemicals and detailed operating instructions are supplied with each analyzer.

Case size: $18\frac{1}{4}$x$7\frac{7}{8}$x$4\frac{5}{8}$ inches.

Weight, completely charged, $15\frac{1}{2}$ pounds.

Complete $60.00

Accessories for 194M8

194M9 Measuring Burettes. With water jacket and rubber stoppers. **Each** $11.00

194M10 Measuring Burettes, Only. Each .... $ 7.00

194M11 Water Jackets, Only. Each .... $ 3.00

194M12 Absorption Pipettes for CO_2. Each ...... $ 2.75

194M13 Absorption Pipettes for CO. Each .... $ 2.85

194M14 Absorption Pipettes for O_2. Each .... $ 2.75

194M15 Hard Rubber Bottles for CO_2 and O_2. Each $3.00

194M16 Hard Rubber Bottles for CO. (Includes copper strips). **Each** $3.10

194M17 Leveling Bottles. Each .... $ .75

194M18 Set of Reagents. Consists of 4 ounces each of Potassium Hydroxide, SeezO_2 and Cuprous Chloride solutions. **Set** $3.00

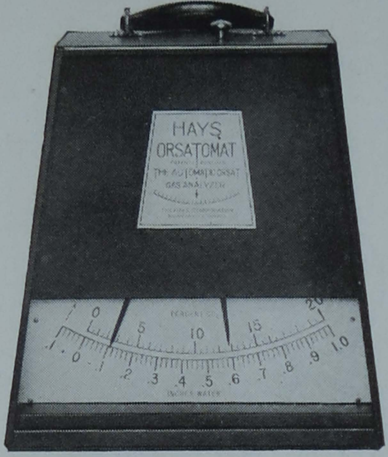
194M19 Set of Reagents. Consists of 6 ounces each of Potassium Hydroxide, SeezO_2 and Cuprous Chloride solutions. **Set** $4.15

194M20 Rubber Expansion Bags. Each $1.25

194M21 Soot Filters. With rubber connections. **Each** .... $ .50

194M22 Aspirator Bulbs. Without tubing. **Each** $1.25

Gas Analyzers, Continued



195M1

195M1 Gas Analyzers, Hays, Orsatomat, Portable, CO_2 or O_2. An automatic flue gas analyzer suitable for field testing. Fragile glass parts are eliminated and no valve manipulation, accurate leveling or burette readings are required.

The sample is aspirated into a measuring chamber and is forced by mercury into the absorption chamber. CO_2 absorption causes a shrinkage in volume of the gas sample and creates a vacuum which is transmitted through the metallic bellows to the pointer, which indicates the CO_2 percentage on the scale at the front of the instrument.

Oxygen percentage is measured in a similar manner. Without flue gas thermometer. **Each** **$60.00**

CUPROUS
CLEANSIN
CARDIS
SEEZO2
HAYS PRODUCTS

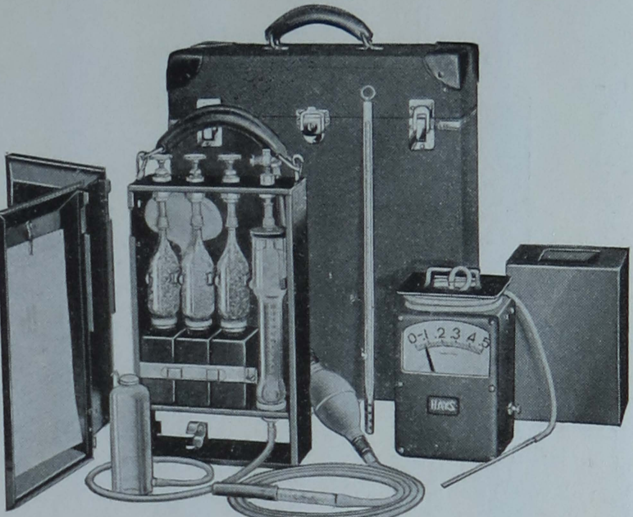
Gas Analyzer Chemicals

Supplied in bottles containing the proper amount for one charge. "Engineer's Model" requires 4-ounce bottles of chemicals; the "Chemist's Model," the 6-ounce size.

Liquid chemicals of the type used in gas analysis cannot be shipped through the mail. These are sealed in tin cans and packed in wood boxes to conform to Interstate Commerce Commission regulations for shipment by express. Kept in their original containers they do not deteriorate.

Size bottle	4 oz.	6 oz.
195M2 Cardisorber. For absorbing carbon dioxide (CO_2) without danger of clogging or corroding the analyzer. **Each**	**$ .45**	**.65**
195M3 Cuprous Chloride. For absorbing carbon monoxide (CO). **Each**	**$ .60**	**.85**
195M4 Pyrogallic Acid. For absorbing oxygen (O_2). **Each**	**$ .60**	**.85**
195M5 SeezO$_2$. For absorbing oxygen (O_2) to a greater degree than "Pyro." **Each**	**$1.95**	**2.65**

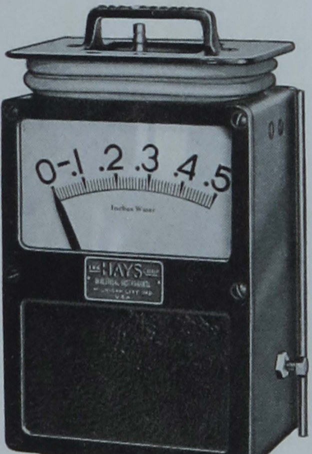
195M6 Cleansing Solution. A quick and easy method of keeping burettes clean and easy to read. **One pint** .... **$ .80**



195M7

195M7 Combustion Test Sets, Hays. Supplied as a combination of several standard Hays portable testing instruments required for a complete combustion investination. The test set as illustrated consists of the 194M1 gas analyzer, a metal armored thermometer for checking flue gas temperatures, and a 195M9 draft gage. There is room in the case for additional instruments as well as screw-driver, wrench, and other small tools. Any one of the instruments can be removed from its compartment in the main case and carried to a job which does not require the others.

The test set can be carried in any position without danger of breakage or spilling chemicals. **Each** **$97.50**



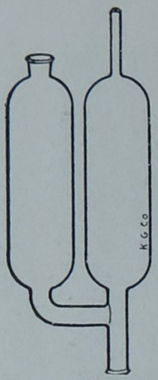
195M9

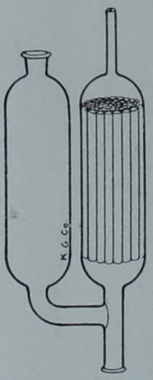
Draft Gages, Portable, Dry Type B. As used in outfit 195M7. An accurate portable gage which uses no liquids and need not be leveled. It employs a slack leather diaphragm unit.

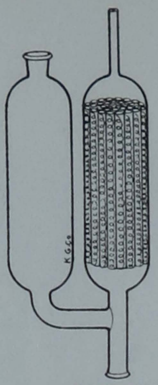
Gage comes in a black-lacquered cast aluminum case with carrying handle and a slip-over sheet steel protecting cover. It can be set up for service in 30 seconds by placing it upright on its rubber pads on any flat surface. A lug is provided for wall mounting when desired. There is a convenient reel for the rubber tubing and clips to hold the copper tube when inserted in stacks. Zero setting screw is located outside the case and adjustment can be made in 5 seconds. Weight, 4¾ pounds. Overall dimensions: 5x4x9 inches. Scale length, 3 inches. Scale and pointer are highly visible. Standard scale ranges are given below.

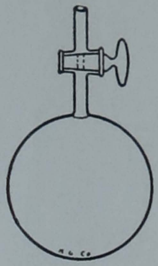
Catalog No.	Scale Range Inches Water	Each
195M8	0-.3	**$22.50**
195M9	0-.5	**$22.50**
195M10	0-1.0	**$22.50**
195M11	0-1.5	**$27.50**
195M12	0-2.0	**$27.50**
195M13	0-5.0	**$27.50**

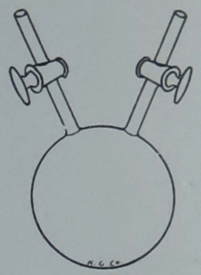
Gas Analysis, Continued


196M1


196M3


196M4


196M5


196M6

196M1 Gas Absorption Pipettes. Plain, with gas chamber of sufficient size to safely hold 100 ml. The outlet at the bottom allows the solution to be changed without taking pipettes from holder. **Each, $2.20.** **Case** of 12............. **$23.76**

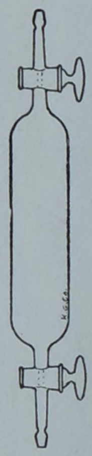
196M2 Gas Absorption Pipettes, Francis Auto-Bubbler. Constructed entirely of Pyrex glass. Has full reagent capacity, is easy to clean, functions smoothly, and is most efficient in all positions where a bubbler type of pipette is of advantage. The seal at the glass valve is effected by the surface tension of the liquid, and due to the differential pressure the seal remains as long as gas is being forced into the pipette. A ground seat is unnecessary and hence the seal is unaffected by sediment, precipitates, or fine particles. **Each**........... **$9.50**

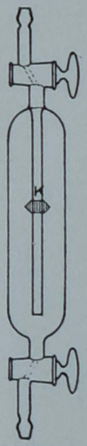
196M3 Gas Absorption Pipettes. With gas chamber of sufficient size to safely hold 100 ml.; and with glass tubes to give rapid absorption. Outlet at the bottom allows the solution to be changed without taking pipette from holder. **Each, $2.60.** **Case** of 12........................ **$28.08**

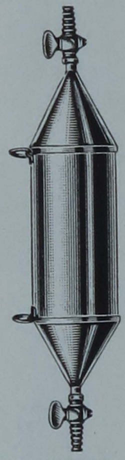
196M4 Gas Absorption Pipettes. Same as 196M3, except gas chamber is filled with copper spirals inside of glass tubes for use with cuprous chloride solutions. **Each**........ **$3.75**
Case of 6.. **$20.25**

196M5 Gas Balloons. Thin blown glass, with one tube and stopcock. The diameter of the bulb is 75 mm. **Each**.. **$ 1.25**
Case of 6.. **$6.75**

196M6 Gas Balloons. Same as 196M5, except with two tubes and two stopcocks. **Each, $2.25.** **Case** of 6........ **$12.15**


196M7

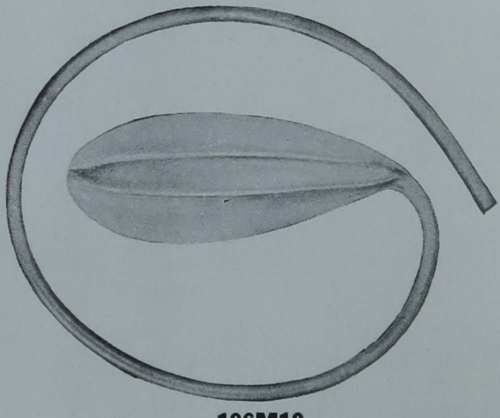

196M8


196M9

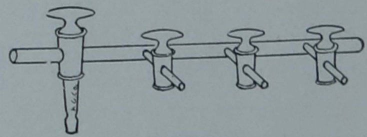
196M7 Gas Collecting Tubes. Has two stopcocks, with capillary stems. The small ends of the stopcock plugs do not extend beyond the tube, so that plugs will not be pushed out when tube is laid on a flat surface. Capacity, 250 ml.
Each, $2.20. **Case** of 6.......................... **$11.88**

196M8 Gas Collecting Tubes, U. S. Bureau of Mines Type. With two stopcocks, with capillary stems, and with capillary tube in the bulb for bubbling gas through mercury. The small ends of the stopcock plugs do not extend beyond the tube, so that plugs will not be pushed out when tube is laid on a flat surface. Capacity, 250 ml. **Each, $3.50.**
Case of 6.................................... **$18.90**

196M9 Gas Collecting Tubes, Copper. For collecting, storing, and transporting small gas samples. Seamless spun ends; leak-proof construction. Each collector is equipped with a pair of wire suspension loops. Coated with metallic copper spray. Capacity, 750 ml. Diameter, 2⅝ inches. Total length, 15 inches. **Each**................................ **$5.00**

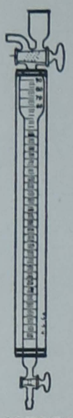

196M10

196M10 Gas Bulb and Tube, Rubber. For Orsat Apparatus. **Each**.. **$1.00**

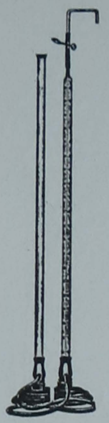

196M11

196M11 Gas Manifold Tubes, Glass. With three vertical one-way stopcocks and one horizontal three-way stopcock having one outlet through the small end of the plug, with capillary tubing. Overall length of manifold, 225 mm.
Each, $5.00. **Case** of 6......................... **$27.00**

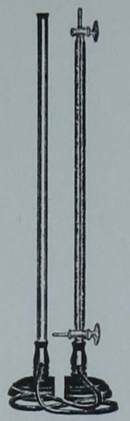
Gas Analysis, Continued



197M1



197M3



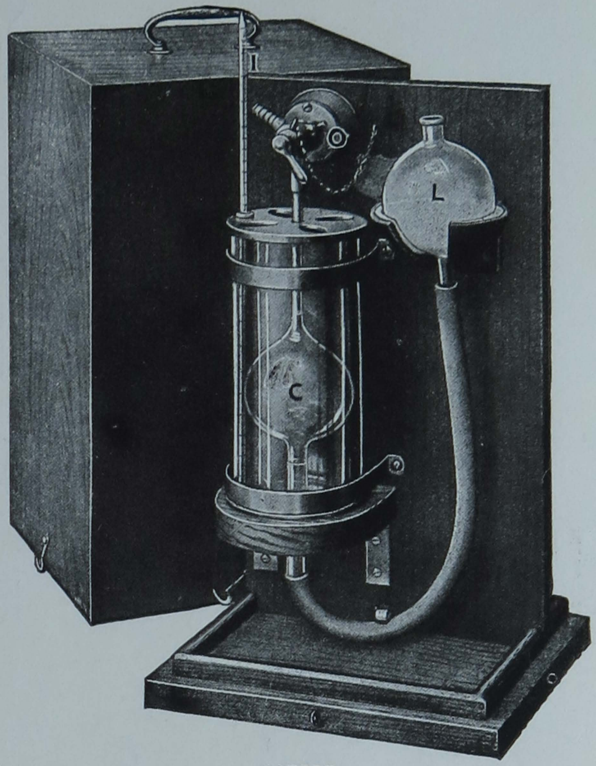
197M4

197M1 Gas Burettes, Exax Blue Line, Bunte. Without water jacket. The enlarged bulb at the top is graduated down from 100 ml. to 50 ml. in 1 ml.; the straight tube is further graduated down from 50 ml. to 0 ml. and then from 0 to 15 ml. in 1/5 ml. A 2-way stopcock is at the bottom; a 3-way, with reservoir cup attached, at the top. **Each**. . $6.00
Case of 6. . . . . $28.80

197M2 Water Jacket. For 197M1. **Each**. . . . . $ 1.00
Dozen, $10.80. Case of 24. . . . . $19.20

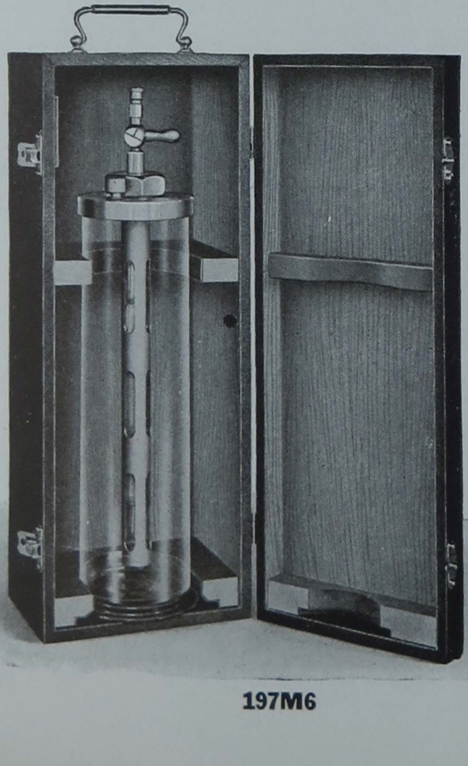
197M3 Gas Burettes, Hempel. Without stopcocks. A bent glass tube for introducing gases is connected to the top of the burette with a rubber tube which is provided with a pinchcock. Both leveling tube and burette are connected with a good grade of rubber tubing and are mounted on a heavy wood base, weighted to prevent tipping. Burette is numbered to read both up and down at every second ml. and is graduated in 1/5 ml. Capacity, 100 ml. **Complete**. . $6.00

197M4 Gas Burettes, Hempel. With Stopcocks. A 3-way stopcock is at the bottom; a 2-way, at the top. The leveling tube and burette are connected with a good grade of rubber tubing and are mounted on a heavily weighted base. Burette is numbered to read both up and down at every second ml. and is graduated in 1/5 ml. Capacity, 100 ml. **Complete**. $8.00



197M5

197M5 Gas Density Apparatus, U. S. Bureau of Standards Type. More accurately employs the effusion method. Purpose of bulb is to have less difference in water levels through extending body of water laterally. Leveling bottle is water reservoir. Bulb inside water jacket is the gas air container. Upper tube terminates in a 3-way stopcock and is held firmly by a metal clamp over top of jar. Orifice plate is of platinum-iridium, carefully finished. Apparatus complete includes thermometer and one extra platinum-iridium orifice tip. In fine polished wood case, 17½x10½x9½ inches. Without stop watch. Weight, including carrying case, 13½ pounds.
Each. $70.00



197M6

197M6 Gas Density Apparatus, Schilling Field Model. For ascertaining the specific gravity or density of gases, especially for field tests in the extraction of gasoline from casing head and natural gas.

The apparatus consists of a glass jar about 3½ inches in diameter and 12 inches deep with an inner graduated glass tube about one inch in diameter, mounted on a brass plate at the top of the jar.

Attached to the tube is a small 3-way cock and a small orifice tip having a platinum orifice plate. The inner tube is protected from breakage by a brass casing, and is narrowed at both ends so as to obtain a more accurate observation of the meniscus as it passes the ring on the narrowed sections at the beginning and end of the test.

In operation the jar is filled with water to the top graduation of the inner tube, which is then withdrawn so as to fill it with air. The cock is closed and the tube replaced. The cock is then opened and, with a stop watch, the time is noted that elapses while the water passes from the lowest graduation to the top graduation. The tube is then withdrawn, and the procedure repeated using the gas.

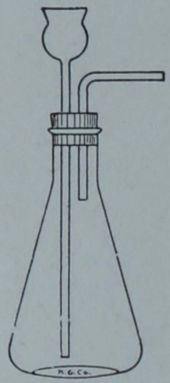
The specific gravity, air being unity, is obtained by dividing the gas time squared by the air time squared.

The apparatus is so designed that the water will not be spilled during transportation.

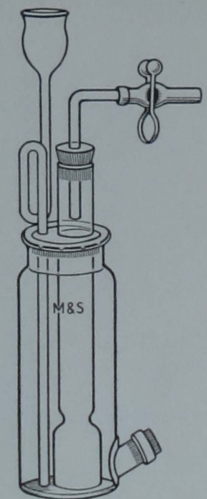
Dimensions of apparatus: height, 15½ inches; diameter, 4½ inches. Weight, including carrying case, 6½ pounds.

Complete, without stop watch. **Each**. $35.00
Stop watch calibrated in 1/5 seconds on outer circle. See page 365.

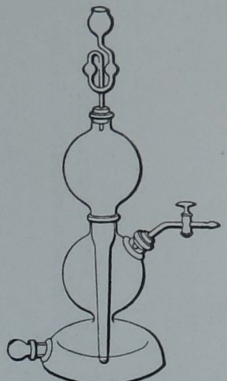
Gas Analysis, Continued



198M1



198M2



198M4

198M1 Gas Generators. Consists of an Erlenmeyer flask, funnel tube, outlet tube and 2-hole rubber stopper. Furnished complete.

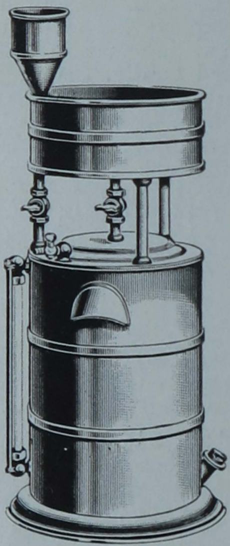
Capacity, ml.	500	1000
Each	**$ .80**	**1.00**

198M2 Gas Generators, Colorado Form. Produces a constant supply of gas. Capacity, 1 liter. **Each** **$2.75**

198M3 Extra Cylinder. For 198M2. **Each** .... **$ .90**

198M4 Gas Generators, Kipp Improved Form.

Capacity, liters	½	1	2
Each	**$10.00**	**12.00**	**15.00**

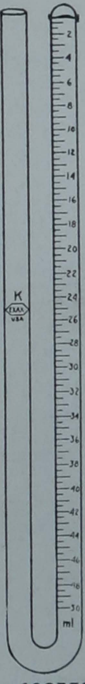


198M5

198M6

198M7

198M8



198M9

198M5 Gas Holders, Berzelius-Peppy. A portable gas holder for field or laboratory use where the collection of gas for testing purposes is difficult owing to insufficient pressure in the source of supply. The principle of operation is essentially that of a displacement bottle. The location of the drain at the bottom of the tank is such that the gas is always sealed by water. Gas cannot escape into the atmosphere, because the water never drains completely unless the tank is tipped or inverted.

Rigidly constructed of heavy copper; all seams double locked and soldered to prevent leakage. Equipped with leak-proof brass T-cocks and stopcock. Exterior coated with metallic copper spray. Gas capacity, 1.33 cubic feet; equivalent water capacity, 10 gallons; height overall, 36 inches; outside diameter, 16 inches. **Each** **$45.00**

198M6 Gas Measuring Tubes, Exax Blue Line. Closed at one end. Without stopcock.

Capacity, ml.	**50**	**100**
Graduated, ml.	1/10	1/5
Each	**$ 1.20**	**1.40**
Case of 12	**$11.52**	**13.44**

198M7 Gas Measuring Tubes, Exax Blue Line. Closed at one end by a glass stopcock. Capacity, 50 ml. in 1/10 ml. **Each, $2.50.** **Case** of 12 .... **$24.00**

198M8 Gas Measuring Tubes, Eudiometers, Exax Blue Line, Bunsen.* With zero at closed end.

Capacity, ml.	**50**	**100**
Graduated, ml.	1/10	1/5
Each	**$ 1.80**	**2.20**
Case of 12	**$17.28**	**21.12**

198M9 Gas Measuring Tubes, Eudiometers, Exax Blue Line, Ure.* Made in "U" form with one plain arm. Capacity, 50 ml. in 1/5 ml. **Each, $2.20.** **Case** of 12. . **$21.12**

*Electrodes are extra according to the current price of platinum.

Gas Generators and Machines

199M1 Gas Generators, Annis-Knight Automatic. Made in sizes to meet almost any requirement. It is compact; requires little space. It will not foul due to accumulation of spent charges in bottom of apparatus. All parts are readily assembled or dismantled and the charges easily renewed.

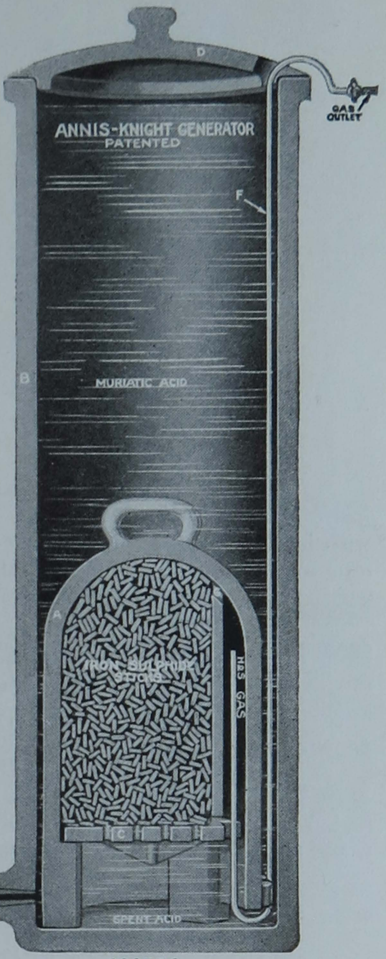
The jar, A, is removed and filled with iron sulphide while in an upright position with the handle down. The iron sulphide should be not less than ½-inch in size and added so that the larger pieces are at the bottom when in the position shown in the illustration. The plate, C, is inserted and given a turn so that the lugs provided for that purpose are engaged. The jar may then be placed in an upright position with the handle uppermost. The pipe, F, is placed in the large container, B, and the jar, A, lowered into position. The pipe is guided into place by two projections on the outside of the jar. The cock, E, and the cock on the pipe, F, are both closed and the container is filled with 10-15% commercial muriatic acid, the height depending on the pressure of the gas desired. The generator is now ready for use and the gas may be drawn off through the pipe, F.

If spent acid and sludge are drawn off through the cock, E, occasionally and fresh acid added at the top, the generator will need no attention until the iron sulphide is exhausted. CO_2, H_2, and other gases may be generated by changing materials.

Size	**1**	**2**	**3**	**4**	**5**	**6**
Iron sulphide, weight, pounds	8	10	25	50	100	200
Acid, gallons	1	2	5	7	12	17
H_2S, cubic feet	30	40	90	175	350	700
Weight, shipping, pounds	30	90	135	200	262	380
Each	**$20.50**	**28.00**	**41.25**	**54.50**	**68.00**	**81.00**

Separate Parts

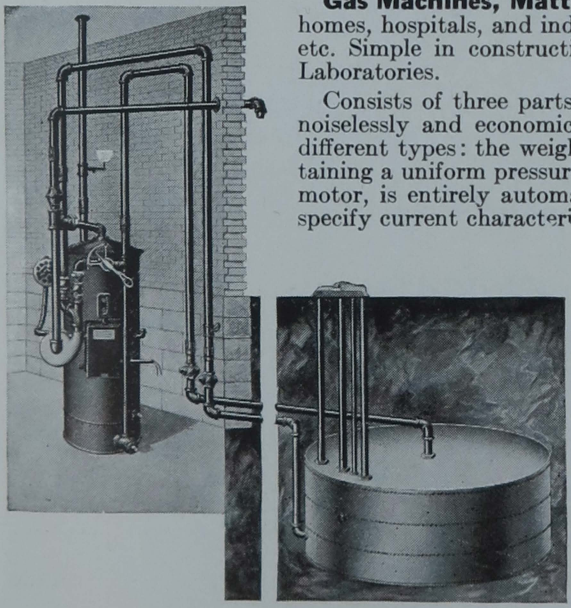
Size	**1**	**2**	**3**	**4**	**5**	**6**
199M2 Jar, A. Each	**$ 8.90**	**8.90**	**13.85**	**20.50**	**23.75**	**31.60**
199M3 Lge. Container, B. Each	**$ 7.20**	**14.50**	**24.25**	**31.60**	**41.75**	**47.75**
199M4 Plate, C. Each	**$ 4.60**	**4.60**	**5.30**	**5.30**	**6.00**	**6.60**
199M5 Cover, D. Each	**$ 1.40**	**1.70**	**1.70**	**2.00**	**2.00**	**2.75**



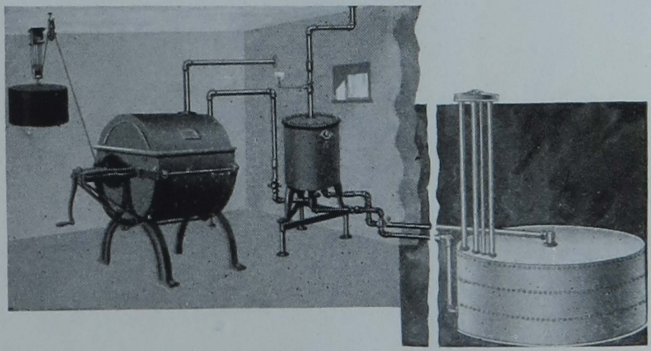
199M1

Gas Machines, Matthews. Designed to supply colleges, community schools, laboratories, clubs, homes, hospitals, and industrial plants with gasoline gas of the correct mixture for cooking, lighting, etc. Simple in construction; dependable for continuous performance. Tested by the Underwriters' Laboratories.

Consists of three parts: carburetor or gas supply tank, air pump and mixing regulator. Operates noiselessly and economically and under ordinary circumstances requires no repairs. Made in two different types: the weight driven, which requires an occasional winding up of the weight for maintaining a uniform pressure, and the electrically operated machine, which is supplied with a 1/10th H. P. motor, is entirely automatic, and can be attached to the ordinary lighting circuit. When ordering, specify current characteristics.



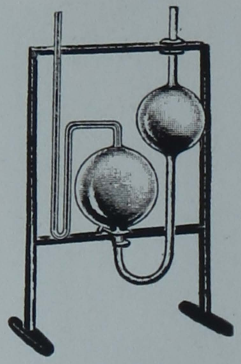
199M6



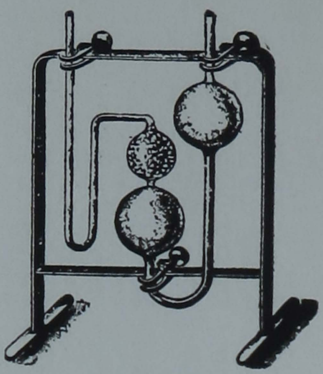
199M7

Size	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Cubic feet per hour	150	200	250	375	500	750	1000	1500
Carburetor, diameter, inches	54	54	60	66	60	66	72	79
Carburetor cells, number	2	2	2	2	3	3	3	3
gallons	100	120	156	202	252	315	367	430
Pipe size, inches	1	1 & 1¼	1¼	1¼ & 1½	1½	1¼ & 2	2	2 & 2½
Weight, shipping, pounds	750	850	1000	1200	1400	1600	1800	2300
199M6 Elect'ly Operated Type. Each	**$360.00**	**435.00**	**485.00**	**560.00**	**690.00**	**830.00**	**975.00**	**1265.00**
199M7 Weight Driven Type. Each	**$360.00**	**435.00**	**485.00**	**560.00**	**690.00**	**830.00**	**975.00**	**1265.00**

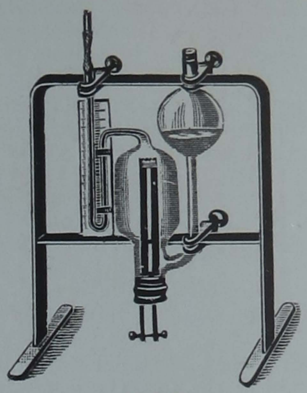
Gas Analysis, Continued



200M1



200M3



200M5

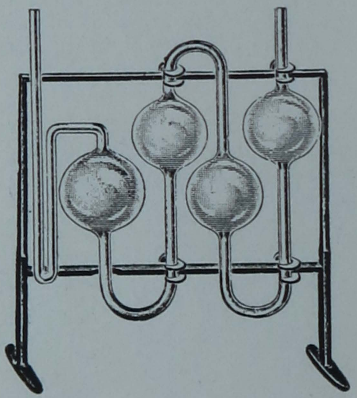
200M1 Gas Pipettes, Hempel, Two Bulbs, Liquid Absorbents, with Support. Consists of absorption and expansion bulbs with inlet tube made of capillary tubing with a white back for clear visibility of level. Pipette is mounted by means of clamps on a metal support with rectangular base. **Each**............ **$4.50**

200M2 Glass Part, Only............ **$2.25**

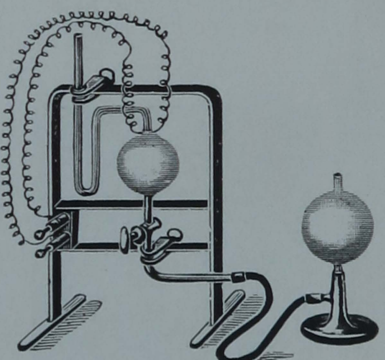
200M3 Gas Pipettes, Hempel, Ethylene, Two Bulbs with Support. For absorption of ethylene in fuming sulphuric acid with auxiliary bulb filled with glass beads. The inlet tube is of capillary bore with white back. Mounted on a metal frame with rectangular base. **Each**............ **$7.00**

200M4 Glass Part, Only............ **$4.75**

200M5 Gas Pipettes, Winkler, Slow Burning, Two Bulbs, with Support. Consists of Hempel pipette with electrodes inserted through the tubulature, with platinum wire spiral which requires a current of 2 to 3 amperes at 6 volts. Mounted on a metal frame with rectangular base. **Each**............ **$9.25**



200M6



200M8

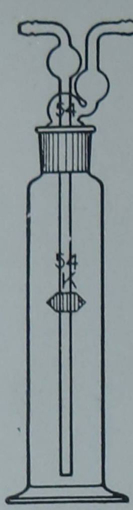
200M6 Gas Pipettes, Hempel, Four Bulb, Liquid Absorbents, with Support. Provides additional bulbs to seal the reagents in the absorption bulb from atmospheric contact. The inlet tube is of capillary bore with white back and the pipette mounted by means of clamps on a strong metal frame with rectangular base. **Each**............ **$6.50**

200M7 Glass Part, Only............ **$4.25**

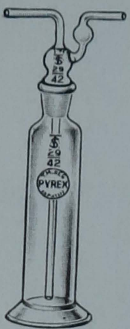
200M8 Gas Pipettes, Hempel, Explosion, Single Bulb, with Support. With platinum electrodes connected to binding posts on the metal support and with stopcock for connection to leveling bulb. The inlet tube is of capillary bore with white back. Mounted on metal support with rectangular base. Complete with leveling bulb with support base. **Each**............ **$10.00**

200M9 Glass Part, Only............ **$7.00**

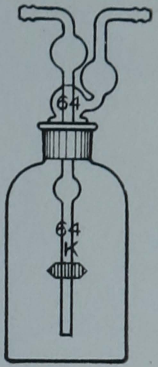
Gas Analysis, Continued



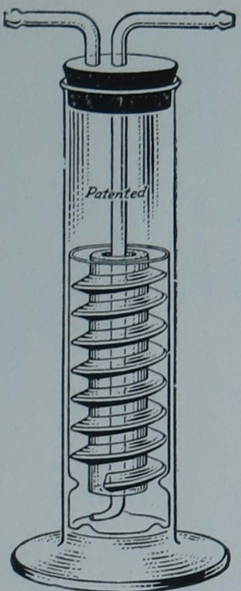
201M1



201M2



201M5



201M7

201M1 Gas Washing Bottles, Drechsel. Tall narrow type, with foot and ground glass stopper having sealed-in outlet and inlet tubes. Stoppers and bottles have corresponding identification numbers.

Capacity, ml.	250	500
Each	**$2.00**	**2.25**

201M2 Gas Washing Bottles, Drechsel, Pyrex. Tall form with ₸ stopper 29/42 and made of Pyrex glass. Otherwise same as 201M1.

Capacity, ml.	125	250	500
Each	**$3.00**	**3.50**	**4.50**
201M3 Bottles, Only. Each	**$1.50**	**2.00**	**3.00**
201M4 Stoppers, Only. Each	**$1.50**	**1.50**	**1.50**

Note: For other gas bottles see page 104.

201M5 Gas Bottles, Washing, Drechsel. Short wide type, with ground glass stopper having sealed-in outlet and inlet tubes. Stoppers and bottles have corresponding identification numbers.

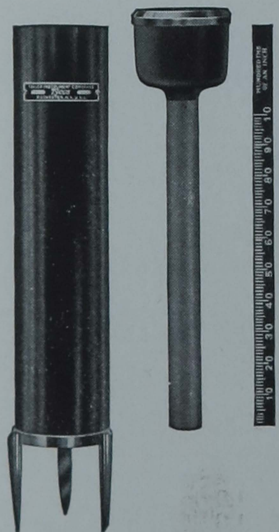
Capacity, ml.	250	500
Each	**$1.75**	**2.00**

201M6 Gas Washing Bottles, Milligan. Glass stoppered. 9 inches high. Contains a hollow glass spiral around which the gas bubbles travel eight times before reaching the three-inch settling chamber at the top where any liquid mechanically entrained, settles out. **Each** **$5.00**

201M7 Gas Washing Bottles, Milligan. Same as 201M6, except equipped with rubber stopper. **Each** **$3.50**

201M8 Gas Washing Bottles, Milligan. Same as 201M6, except provided with a cork stopper. **Each** **$3.50**

Gauges



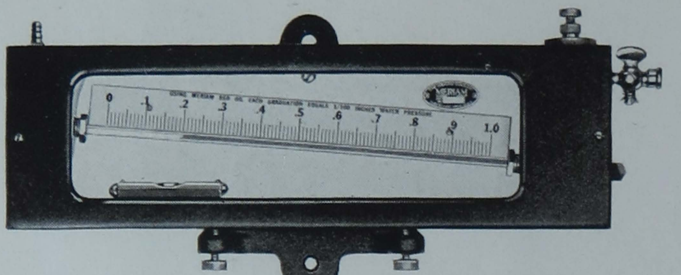
201M9

201M10

201M9 Gauges, Rain. Rain is caught in the funnel at the top and conducted down to an inner receiving can. When measuring the amount of water that has accumulated, the top of the funnel is lifted off and the measuring stick inserted into the inner can. Consists of blue-bronzed cylindrical case, 3 inches in diameter and 13½ inches high, with brass rim at top and bottom and three pointed brass feet 3 inches long, which when forced into the ground hold the gauge upright; two graduated measuring sticks to show from .01 to 1.0 inch of rain and overflow slot to take care of rains heavier than 1.0. **Each** **$12.00**

201M10 Gauges, Rain. U. S. Weather-Bureau Type. Similar to 201M9, except consists of galvanized metal container, 27 inches high and 8 inches inside diameter; brass receiver and brass inner container 2.53 inches in diameter; and graduated measuring stick reading from .01 inch to 2.0 inches of rain. Outer case serves as overflow container or as snow gauge when container is removed. **Each** **$17.00**

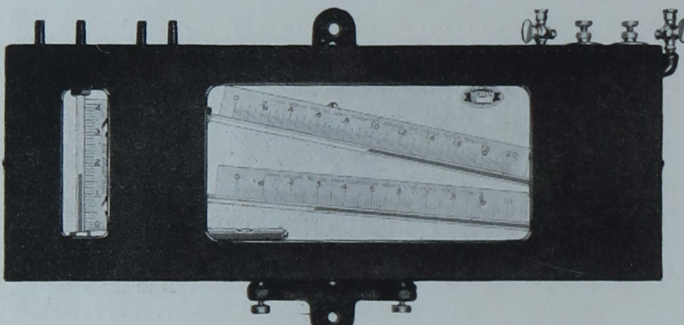
Gauges, Continued



202M1

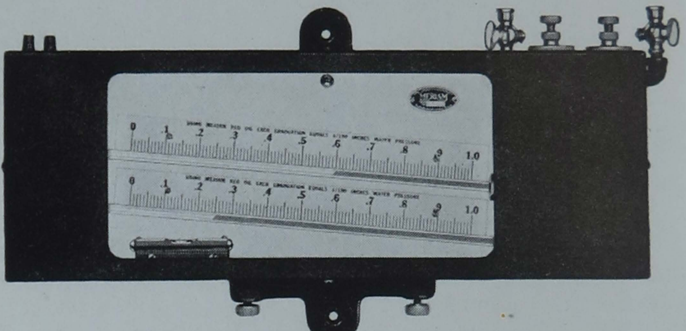
202M1 Gauges, Draft, Single Tube. Range, ½ to 2 inches, as shown in table below, with inches of water scale, using red oil. Includes one ⅛-inch I. P. S. vented petcock, ⅛-inch I. P. S. hose nipple, one pint of Meriam red oil. Size of case, 5¼x17¼x2⅝ inches. **Each**........................**$30.00**

202M2 Gauges, Draft, Single Tube. Range, 3 and 4 inches. Case size, 9⅜x17⅝x2½ inches. **Each**..............**$36.00**



202M4

Gauges, Draft, Meriam, Model GP. Inclined tube liquid type, rugged in construction, positive in indication, without moving parts, for continued accuracy in reading, and of a design to give long periods of accurate operation service. The scale range is amplified several times for accurate reading of pressures in fractional inches of water pressure. Suitable as an indicating flow meter in measuring low pressure air or gas flows.



202M3

202M3 Gauges, Draft, Two-Tube. All ranges as shown in table below with inches of water scale using red oil. Includes two ⅛-inch I. P. S. vented petcocks, two ⅛-inch I. P. S. hose nipples, ½ pint Meriam red oil. Size of case, 7¼x20½x2⅜ inches. **Each**..............................**$54.00**

202M4 Gauges, Draft, Three-Tube. All ranges as shown in table below. Incorporates all the features of 202M3 two-tube gauge plus an added vertical tube, and can be furnished for either oil or mercury indicating fluid (specify which), but not for both. The standard graduation for the vertical tube is inches and tenths of water pressure when using red oil having specific gravity of 0.827. Includes three ⅛-inch I. P. S. vented petcocks, three ⅛ I. P. S. hose nipples and one pint of Meriam red oil. Size of case: 9x25¼x2⅜ inches. **Each**......**$75.00**

Ranges for Single Tube Gauges 202M1 and 202M2.

Maximum range, inches	.5	1.0	1.5	2.0	3.0	4.0	.1-.4	.1-.9	.5-1.0	.1-1.4	.5-1.5	1.0-2.0	1.0-3.0
Scale length, inches	11	11	11	11	12	12	11	11	11	11	11	12	12
Scale Multiplier	22	11	7.3	5.5	4	3	22	11	7.3	7.3	5.5	4	3
Unit scale divisions, inches of water	.01	.01	.01	.01	.02	.02	.01	.01	.01	.01	.01	.02	.02

Ranges for Two-Tube Gauges 202M3.

Max. range, in., upper tube	.5	1.0	1.5	2.0	1.0	1.5	1.5	2.0	2.0	1.5	2.0	.1-.9	.1-1.4
Max. range, in., lower tube	.5	1.0	1.5	2.0	.5	.5	1.0	1.0	1.5	.1-.9	.1-.9	.1-.9	.1-1.4
Scale length, inches	11	11	11	11	11	11	11	11	11	11	11	11	11
Scale multiplier, in., upper tube	22	11	7.3	5.5	11	7.3	7.3	5.5	5.5	7.3	5.5	11	7.3
Scale multiplier, in., lower tube	22	11	7.3	5.5	22	22	11	11	7.3	11	11	11	7.3
Unit scale div., in. water, upper tube	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
Unit scale div., in. water, lower tube	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01

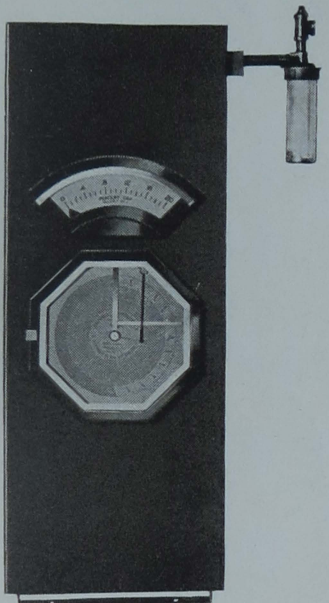
Ranges for Three-Tube Gauges 202M4.

Maximum range, inches, upper tube	.5	1.0	1.5	2.0	1.0	1.5	2.0	.1-.9	.1-1.4
Maximum range, inches, lower tube	.5	1.0	1.5	2.0	1.0	1.0	.1-.9	.1-.9	.1-1.4
Maximum range, inches, vertical tube	4	4	4	4	13	4	13	4	4
Scale length, inches, inclined tube	11	11	11	11	11	11	11	11	11
Scale length, inches, vertical tube	5	5	5	5	5	5	5	5	5
Scale multiplier, upper tube	22	11	7.3	5.5	11	7.3	5.5	11	7.3
Scale multiplier, lower tube	22	11	7.3	5.5	11	11	11	11	7.3
Scale multiplier, vertical tube	1.2	1.2	1.2	1.2	.4	1.2	.4	1.2	1.2
Unit scale divisions, in. of water, upper tube	.01	.01	.01	.01	.01	.01	.01	.01	.01
Unit scale divisions, in. of water, lower tube	.01	.01	.01	.01	.01	.01	.01	.01	.01
Unit scale divisions, in. of water, vertical tube	.1	.1	.1	.1	.25	.1	.25	.1	.1

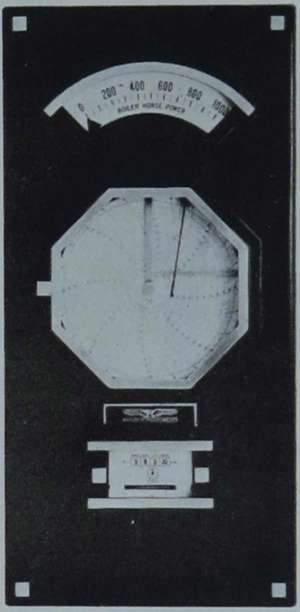
202M5 Meriam Red Oil. (Sp. gr. 0.827). Pints	½	1	2
Each	**$ .75**	**1.14**	**1.50**

Gauges, Continued

Republic Meters

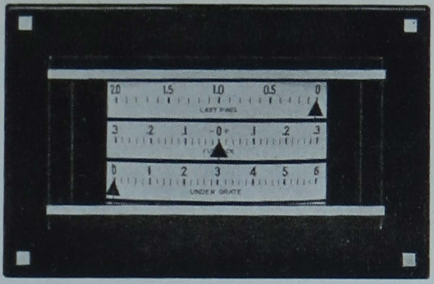


Republic Indicating and Recording CO₂ Meters



Republic Indicating, Recording and Integrating Flow Meters

Complete catalog sent upon request.



203M1

Gauges, Draft, Pointer Type, Republic. Actuated by a diaphragm or bellows type mechanism directly connected to a 12-inch pointer arm which travels horizontally across a 14-inch illuminated scale. Made up of a series of separate indicating units, and can be supplied in any combination and number of units desired. The entire instrument is housed in a dustproof, compact, neat appearing case for either projected or flush mounting.

Standard ranges from 0-0.6 to 0-8.0 inches.

203M1 Gauges, Draft, 2-Pointer. Each	**$ 85.00**
203M2 Gauges, Draft, 3-Pointer. Each	**$115.00**
203M3 Gauges, Draft, 4-Pointer. Each	**$148.00**
203M4 Gauges, Draft, 5-Pointer. Each	**$181.00**
203M5 Gauges, Draft, 6-Pointer. Each	**$214.00**

203M8

Gauges, Vacuum, Mercurial, Open Cistern, Tag. Has the vacuum connection at the top of the mercury column. As the vacuum increases, the atmospheric pressure at the cistern forces the mercury higher into the tube, lowering the level of the cistern, while a decrease in vacuum forces the mercury down the tube, raising the level in the cistern. Adjustment of scale by turning a knurled thumbscrew is necessary before taking a reading in order that the zero graduation may coincide with the mercury level. Scale is graduated 0 to 31 inches in 1/10ths. Gauges may be obtained with or without a trap or panel as listed. In cylindrical metal case with polished bronze cover with glass front, brass fittings, curved metal scale.

203M13

Gauges, Vacuum, Mercurial, Absolute Pressure, Tag. Equipped with a glass tube closed at the upper end and completely filled with mercury when the cistern is under atmospheric pressure. The vacuum connection is attached at the cistern, and, as vacuum is applied to the gauge, the reduced pressure is no longer able to support the full height of the mercury column, which falls a proportionate amount. The readings indicate absolute pressure (vacuum), as well as the pressure reduction below atmospheric. The gauge is protected from dirt and moisture by a device which maintains the correct mercury level in the cistern trap. Gauges may be obtained with or without trap or panel. The standard scale indicates absolute pressure in inches, with equivalent pounds opposite.

203M16

203M6 Gauges.	With no panel; no trap. **Each**	**$60.00**
203M7 Gauges.	With no panel; with trap. **Each**	**80.00**
203M8 Gauges.	With panel; with trap. **Each**	**$86.00**
203M9 Gauges.	With panel; no trap. **Each**	**$66.00**

Gauges, Vacuum, Mercurial, Open Cistern, Tag. Same as above, except in rectangular polished hardwood case with brass fittings, glass front, and metal scale.

203M10 Gauges.	With no panel; no trap. **Each**	**$40.00**
203M11 Gauges.	With panel; no trap. **Each**	**$46.00**
203M12 Gauges.	With no panel; with trap. **Each**	**$60.00**
203M13 Gauges.	With panel; with trap. **Each**	**$66.00**

Gauges. Range, 0 to 12 inches.

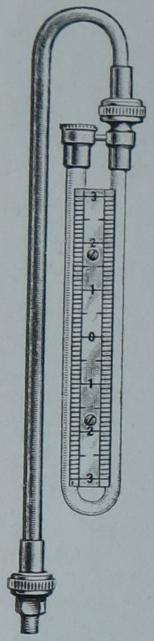
203M14	With no panel; no trap. **Each**	**$65.00**
203M15	With no panel; with trap. **Each**	**$85.00**
203M16	With panel; with trap. **Each**	**$91.00**
203M17	With panel; no trap. **Each**	**$71.00**

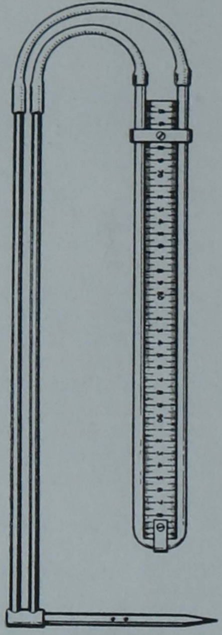
Gauges, Range 0 to 20 inches.

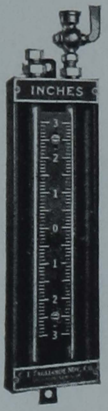
203M18	With no panel; no trap. **Each**	**$75.00**
203M19	With no panel; with trap. **Each**	**$ 95.00**
203M20	With panel; with trap. **Each**	**$101.00**
203M21	With panel; no trap. **Each**	**$ 81.00**

Note: Gauges with scale indicating absolute pressure in pounds with equivalent temperature scale or other equivalent scales selected, can be furnished at an additional charge. Prices and information on request.

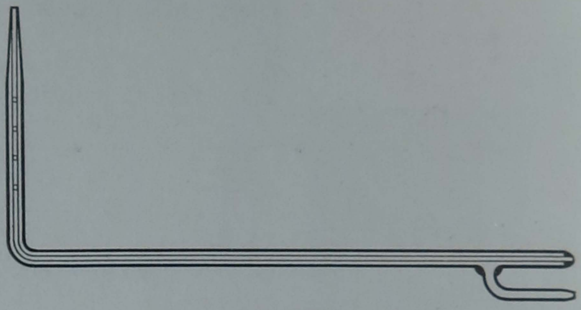
Gauges, Continued

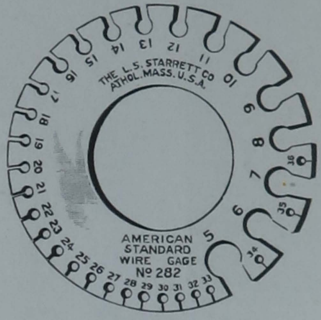

204M1


204M2



204M3


204M5



204M6

204M1 Gauges, Syphon. U-tube manometers intended for ordinary routine use where fairly accurate indications of pressure or vacuum are desired. Readings are in tenths of an inch. Instrument consists of an annealed glass U-tube of uniform bore, supported by nickel-plated brass fittings, and equipped with a clearly numbered metal scale subdivided in inches and tenths. Numbering above zero mark proceeds upward; below, downward. Preparatory to its use, the tube is filled with water or mercury to the zero position on the scale. Pressures are read by taking the sum of the readings on both portions of the scale. Couplings are identical in all sizes. Each coupling consists of a standard coupling nut, plus a ⅛-inch I. P. S. male adapter for use when the manometer is to be screwed into a pipe.

Size	**1**	**2**	**3**	**4**	**5**	**6**
Capacity, inches	4	6	8	12	18	24
Length, Total	10	12	14	18	24	30
Each	**$4.50**	**5.00**	**5.50**	**7.50**	**12.00**	**18.00**

204M2 Gauges, Differential, Pitot Tube. For accurate measurements of the flow of gases and liquids, also as a velocity indicator in pipes conveying air, water or steam. Consists of a Pitot tube made of brass, nickeled, and a glass manometer tube mounted on a scale ½ meter long, graduated in both metric and English systems. Length, overall, 18 inches; length, angle stem, 6 inches. Complete with set of curves for conversion of pressure values into velocities or feet per second or miles per hour for either air or water. **Each** **$10.00**

204M3 Gauges, U, Tag. For use with either water or mercury for measuring low pressures, vacuum or differential pressures. Maximum protection against breakage is afforded by pressed steel construction in which the glass tube is supported below the surface of the gauge. Metal scale is easy to read; simple to adjust. Standard construction includes use of Pyrex tubing that will withstand pressures up to 300 pounds per square inch. Connections, ⅛-inch standard pipe thread. Graduations, ⅒ inches.

Size, inches	4	6	10	15	30
Each	**$5.00**	**5.75**	**7.00**	**9.50**	**16.00**

204M4 Pitot Tubes, Brass. Double walled; designed according to A. S. H. V. E. For measuring velocity of liquids and gases. Length, 20 inches. **Each** **$35.00**

204M5 Pitot Tubes, Glass. Same as 204M4, except made of glass. Suitable for routine tests and for demonstration of the Pitot Tube principle. Length, 8 inches. **Each** **$3.00**

204M6 Gauges, Wire. American standard or B. & S. gauge. Sizes, 5 to 36. The decimal equivalents (approximate) are stamped on the reverse side. **Each** **$3.50**

Gauges, Continued

205M1

Gauges, Pressure and Vacuum Recording, Tag. With 9-inch chart. Supplements the performance of the conventional pressure indicator with important records. Gives a continuous story of not only the pressure changes, but also when they take place and for what period of time.

Supplied with either one or two pens, and for the latter, two separate actuating mechanisms recording on the same chart. The pen travel is 3$\frac{5}{16}$ inches.

The case is rectangular, weather-proof black enameled aluminum; back or bottom connected as selected.

Furnished with $\frac{1}{4}$-inch S. P. T. brass union connection, and electric or spring wound clock as specified, 100 charts of range selected from list below, and ink.

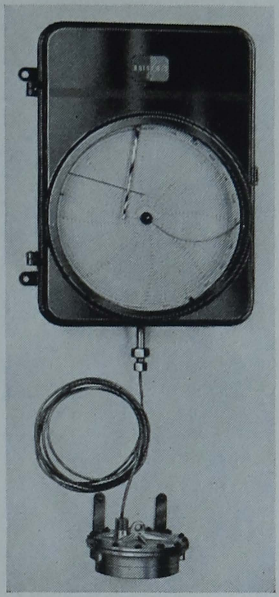
Flanged case for flush mounting can be supplied at no extra charge when specified.

205M1 Gauges, Pressure Recording, Tag.

Number of pens	1	2
Each	**$49.50**	**75.75**

205M2 Gauges, Combination Vacuum-Pressure, Tag.
Each **$49.50**

Note: Stainless steel fittings, instead of brass, can be furnished at an extra charge.



205M3

205M3 Gauges, Recording, Liquid Level. A pressure gauge instrument for automatically recording the depth of water or other liquids in tanks, reservoirs, rivers, canals, sewers, tail races; and also for recording the depth and rate of flow of water over wiers and volume of liquid tanks.

A metal bulb is connected to the instrument with a flexible capillary tubing. The bulb itself is cut away on the under side to permit the entrance of the liquid. In the bulb is a diaphragm against which the pressure of the liquid is exerted.

The whole working system is air filled and it is thus that the pressures are transmitted through the capillary tubing to the recording instruments where they are recorded in units of feet, inches or other units of measurement as desired.

Two very important facts in regard to this instrument are: first, that the instrument may be installed at a convenient location, whether above or below the bulb level; second, as air is the transmitting medium there is no danger of freezing. The operation of the instrument is not affected by any ordinary temperature.

The gauge can be furnished with alarm attachments to ring a bell when the level of the liquid goes above or below a certain point. Can be installed in connection with a long-distance transmitting system which permits the record to be transmitted over a distance of even several miles. Prices upon application.

Tag Pressure Charts for 205M1

Number	Range	Chart Duration	Graduation Intervals
205M4	0 to 20	24-hour	$\frac{1}{5}$
205M5	0 to 30	24-hour	$\frac{1}{2}$
205M6	0 to 30	7-day	$\frac{1}{2}$
205M7	0 to 35	24-hour	$\frac{1}{2}$
205M8	0 to 50	24-hour	1
205M9	0 to 60	24-hour	1
205M10	0 to 80	24-hour	1
205M11	0 to 80	7-day	1
205M12	0 to 90	24-hour	1
205M13	0 to 105	7-day	1
205M14	0 to 110	12-hour	1
205M15	0 to 110	24-hour	1
205M16	0 to 150	24-hour	2
205M17	0 to 150	4-day	2
205M18	0 to 150	7-day	2
205M19	0 to 200	24-hour	2
205M20	0 to 250	24-hour	5
205M21	0 to 250	7-day	5
205M22	0 to 300	24-hour	4
205M23	0 to 300	7-day	4
205M24	0 to 400	24-hour	5
205M25	0 to 500	6-hour	5
205M26	0 to 500	24-hour	5
205M27	0 to 600	24-hour	5

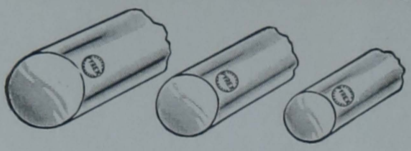
Tag Combination Vacuum-Pressure Charts for 205M2

Number	Range	Chart Duration	Graduation Intervals
205M28	30-inch mercury vacuum to 20-inch mercury pressure	24-hour	1 inch—1 inch
205M29	30-inch mercury vacuum to 30 pounds pressure	24-hour	1 inch—1 pound
205M30	30-inch mercury vacuum to 50 pounds pressure	7-day	2-inch—1 pound
205M31	30-inch mercury vacuum to 150 pounds pressure	24-hour	5-inch—2 pounds
205M32	30-inch mercury vacuum to 200 pounds pressure	24-hour	5-inch—2 pounds
205M33	30-inch mercury vacuum to 300 pounds pressure	24-hour	15-inch—5 pounds

205M34 Gauze, Absorbent. Made of cotton. Weave, 32x28. Width, 36 inches. Folded to 18-inch width in oval roll.
100-yard bolt **$6.00**

205M35 Gauze, Absorbent. Same as 205M34, except weave is 28x24. **100-yard bolt** **$5.00**

Glass Rods and Tubing



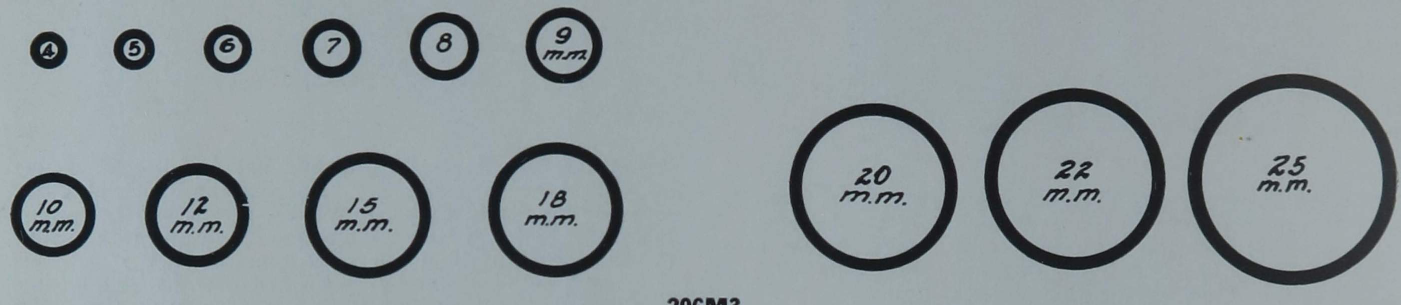
206M2

206M1 Glass Rod. Machine made in factory lengths of approximately 5 feet, and selected so that the variation in diameter is as follows: From 3 to 9 mm., inclusive, ½ mm.; from 10 to 13 mm., 1 mm.

Diameter, mm.	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
Weight, pounds per foot	.018	.022	.033	.048	.067	.083	.1	.143	.167	.2	.25
Pound	**$ .70**	**.70**	**.54**	**.54**	**.54**	**.54**	**.33**	**.33**	**.33**	**.33**	**.33**

206M2 Glass Rod, Pyrex. Furnished in approximately 3-foot lengths.

Diameter, mm.	**5**	**6**	**7**	**8**	**9**	**10**
Weight, pounds per foot	.029	.042	.058	.075	.095	.118
Variation, outside diameter, mm.	.5	.5	.5	.5	.5	.5
Pound	**$ .90**	**.90**	**.90**	**.90**	**.90**	**.90**
Case of 15 pounds	**$12.15**	**12.15**	**12.15**	**12.15**	**12.15**	**12.15**

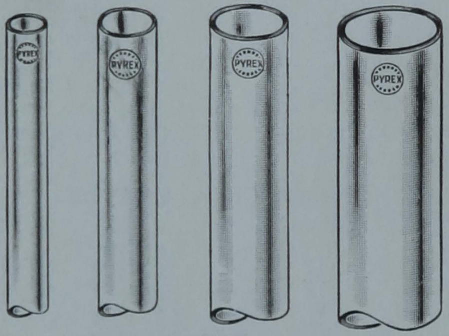


206M3

206M3 Glass Tubing. Machine made. Standard grade of soft glass tubing. Especially suitable for bending, glass blowing, and for fitting up chemical apparatus. Furnished in approximately 5-foot lengths, and is selected so that the variation in diameter is as follows: From 5 to 13 mm., inclusive, ±½ mm.; from 14 to 26 mm., inclusive, ±1 mm. The wall thickness for tubing of diameter 5 to 13 mm., inclusive, is 1 to 1.25 mm.; for tubing of diameter 14 to 26 mm., inclusive, is 1.25 to 1.50 mm.

Diameter, outside, mm.	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Weight, lbs., approximate, per foot	.018	0.23	.028	.035	.041	.046	.052	.058	.064	.070	.091	.098
Pound	**$ .70**	**.50**	**.50**	**.50**	**.50**	**.38**	**.38**	**.38**	**.38**	**.38**	**.32**	**.32**

Diameter, outside, mm., continued	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**
Weight, pounds, approximate, per foot	.106	.113	.120	.127	.135	.142	.149	.156	.163	.170	.178
Pound	**$ .32**	**.32**	**.32**	**.32**	**.32**	**.32**	**.32**	**.32**	**.32**	**.32**	**.32**



206M4

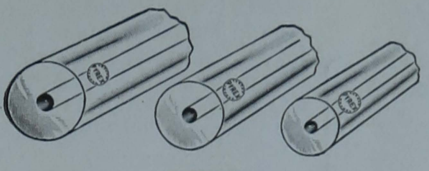
206M4 Glass Tubing, Pyrex. Standard wall tubing, recommended for laboratory use where sudden changes in temperature or extraordinary strength is required. Packed in case of approximately 25 pounds. Furnished in 4-foot lengths.

Diameter, outside, mm.	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Variation, outside diameter, mm.	± .5	.5	.5	.5	.5	.5	.5	.5	.5
Wall thickness, approximate, mm.	.8	.8	1	1	1	1	1	1	1
Weight, pounds, approximate, per foot	.0113	.0156	.0234	.0284	.0331	.0378	.0426	.0472	.0520
Pound	**$ 1.00**	**.90**	**.85**	**.80**	**.80**	**.80**	**.80**	**.80**	**.80**
Case of 25 pounds	**$22.50**	**20.25**	**19.13**	**18.00**	**18.00**	**18.00**	**18.00**	**18.00**	**18.00**

Diameter, outside, mm., continued	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**22**	**25**
Variation, outside diameter, mm.	± .5	.5	.5	.5	.5	.5	.5	.75	.75
Wall thickness, approximate, mm.	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.5	1.5
Weight, pounds, approximate, per foot	.0669	.0727	.0783	.0840	.0891	.0953	.1010	.1454	.1667
Pound	**$ .80**	**.80**	**.85**	**.85**	**.85**	**.85**	**.90**	**.90**	**.95**
Case of 25 pounds	**$18.00**	**18.00**	**19.13**	**19.13**	**19.13**	**19.13**	**20.25**	**20.25**	**21.38**

Diameter, outside, mm., continued	**28**	**30**	**32**	**35**	**38**	**41**	**45**	**48**	**51**
Variation, outside diameter, mm.	± 1	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Wall thickness, approximate, mm.	1.5	1.8	1.8	2	2	2	2	2	2
Weight, pounds, approximate, per foot	.1879	.2174	.2300	.2825	.3081	.3689	.4065	.4349	.4632
Pound	**$ .95**	**1.00**	**1.10**	**1.10**	**1.25**	**1.25**	**1.25**	**1.25**	**1.50**
Case of 25 pounds	**$21.38**	**22.50**	**24.75**	**24.75**	**28.13**	**28.13**	**28.13**	**28.13**	**33.75**

Glass Tubing, Continued



207M2

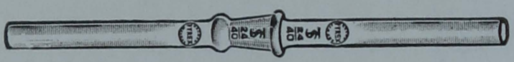
207M1 Glass Tubing, Barometer and Capillary. Furnished in approximately 5-foot lengths.

Diameter of bore, mm.	½–1	1–2	2–4
Diameter, outside, mm.	5–7	6–8	7–10
Wall thickness, approximate, mm.	2½	2½	2½–3
Weight, pounds approximate, per foot	.04	.066	.10
Pound	**$1.00**	**1.00**	**1.00**

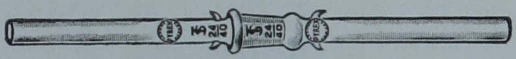
207M2 Glass Tubing, Capillary, Pyrex. Furnished in 3-foot lengths.

Diameter of bore, mm.	¼–¾	¾–1¼	1¼–1¾	1¾–2¼	2¼–3
Diameter, outside, mm.	5–6	6–7	7–8	7–8	8–10
Weight, pounds approximate, per foot	.0354	.0487	.0635	.0616	.0874
Pound	**$ 1.50**	**1.50**	**1.50**	**1.50**	**1.50**
Case of 15 pounds	**$20.25**	**20.25**	**20.25**	**20.25**	**20.25**

207M3 Glass Tubing, Electrode, Pyrex. Properly composed for the fabrication of thin glass membranes for measuring hydrogen-ion activity or pH. Wall thickness is of about 0.5 to 1.2 mm., depending on diameter. Furnished in 3-foot lengths. Outside diameter, 5 to 10 mm. **Pound** **$4.00**



207M4



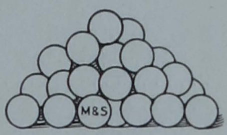
207M5

207M4 Glass Joints, Pyrex. Consists of two sections of Pyrex glass tubing to be sealed to Pyrex glass apparatus, connected by interchangeable full length standard tapered ground joints, in accordance with CS21-36 of the National Bureau of Standards.

Diameter, outside, tube, mm.	**5**	**7**	**9**	**11**	**15**	**20**	**25**	**30**	**40**	**50**
Diameter joint, large end, mm.	7	10	12	14	19	24	29	34	45	55
Length joint, ground zone, mm.	25	30	30	35	38	40	42	45	50	50
Quantity in case	12	12	12	12	12	12	12	6	6	4
Each	**$ 1.30**	**1.40**	**1.50**	**1.60**	**1.70**	**1.80**	**2.00**	**2.50**	**3.90**	**4.70**
Case	**$14.04**	**15.12**	**16.20**	**17.28**	**18.36**	**19.44**	**21.60**	**13.50**	**21.06**	**16.92**

207M5 Glass Joints, Pyrex. Same as 207M4, except provided with glass hooks for fastening with rubber bands or light metal coil springs.

Diameter, outside, tube, mm.	**5**	**7**	**9**	**11**	**15**	**20**	**25**	**30**	**40**	**50**
Diameter joint, large end, mm.	7	10	12	14	19	24	29	34	45	55
Length joint, ground zone, mm.	25	30	30	35	38	40	42	45	50	50
Quantity in case	12	12	12	12	12	12	12	6	6	4
Each	**$ 1.40**	**1.50**	**1.60**	**1.70**	**1.80**	**1.90**	**2.20**	**2.70**	**4.20**	**5.00**
Case	**$15.12**	**16.20**	**17.28**	**18.36**	**19.44**	**20.52**	**23.76**	**14.58**	**22.68**	**18.00**



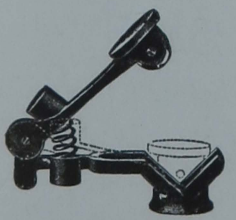
207M6

207MS Glass Beads, Solid. Approximately spherical.

Diameter, mm	3	4	5	6
Pound	**$1.75**	**1.75**	**1.75**	**1.75**

207M7 Glass Beads, Hollow Perforated. Approximately spherical and have a perforation to increase the area.

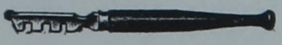
Diameter, mm.	3	4	5	6
Pound	**$1.75**	**1.75**	**1.75**	**1.75**



207M8

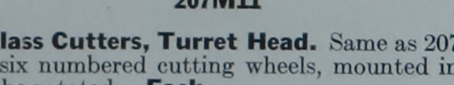
207M8 Glass Cutters, Griffin. For cutting glass tubing up to 30 mm. diameter. Made of brass, nickel plated. **Each** **$1.25**

207M9 Extra Steel Wheels. Each . . . . . . **$ .15**



207M10

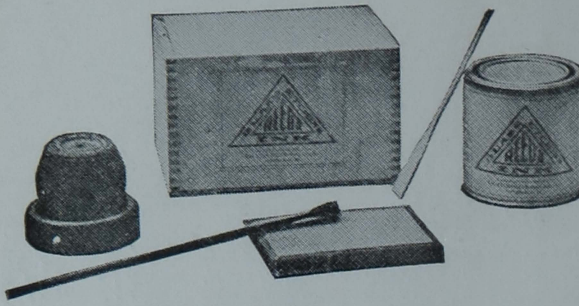
207M10 Glass Cutters. For cutting sheet or plate glass. **Each** . . . . . . **$ .20**



207M11

207M11 Glass Cutters, Turret Head. Same as 207M10, except with six numbered cutting wheels, mounted in a turret which can be rotated. **Each** . . . . . . **$ .50**

Glass Etching Ink



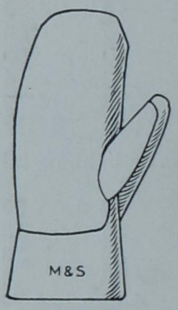
208M1

208M1 Glass Etching Ink, Reed's. For marking glassware of any shape; round, flat or irregular. Consists of one-half pint can of Reed's Etching Ink, a lead pad, a camel hair brush, flexible form adapter and a rubber stamp to make an impression. Can be used to advantage by any person and while its action is rapid, permanent and economical, it is harmless to the hands or clothing. Standard outfit with ½-pint can of ink, complete. **Each** **$14.00**

Extra Parts

208M2 Flexible Form Adapters. Each	**$2.00**
208M3 Special Rubber Dies. Each	**$2.50**
208M4 Lead Pads. Each	**$ .60**
208M5 Camel Hair Brushes. Each	**$ .40**

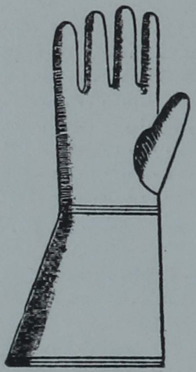
Gloves



208M6

208M10

208M11



208M12

208M14

208M6 Asbestos Mittens, Reversible Type. With thumb only. Made of best asbestos cloth. Comfortably worn on either hand, insuring double wear. Double thickness on palm, back and thumb. Inside lined.

Length, inches	14	18
Pair	**$2.50**	**4.00**

208M7 Asbestos Mittens. Same as 208M6, except separate mitten only. **Each**	**$1.30**	**2.10**
208M8 Asbestos Mittens. With thumb and one finger. **Pair**	**$3.25**	**4.75**

208M9 Asbestos Gloves. With thumb and four fingers. Length, 14 inches. **Pair** **$4.50**

208M10 Gloves, Rubber, Latex. All rubber, translucent, amber Latex glove, light weight. For general laboratory and chemical use. Rolled edge at wrist. Roughened surface for better grip. Resistant to acid and difficult to tear or snag.

Size	9	10	11
Pair	**$ .40**	**.40**	**.40**

208M11 Gloves, Rubber, Acid. Molded, seamless, heavy, of steam cured rubber. Gray, no cloth backing. For acid handling and general purpose.

Size	9	9½	10	11
Pair	**$2.25**	**2.25**	**2.25**	**2.25**

208M12 Gloves, Rubber, White. With gauntlet. Designed for the heaviest work. Inside lined with netting. Are sufficiently stiff to stay up on arms without collapsing and to allow constant circulation of air in the gloves. Supplied in medium size.

Length of gauntlet, inches	5	9	12	15	19
Pair	**$3.00**	**3.25**	**3.50**	**4.00**	**4.75**

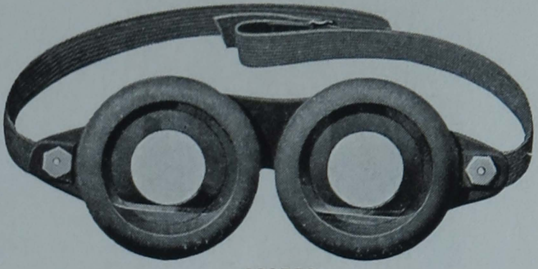
208M13 Gloves, Rubber, White. Same as 208M12, except wrist length, without gauntlet. **Pair** **$2.50**

208M14 Gloves, Gasoline and Oil Proof. Made of Neoprene. An exceptionally tough though extremely pliable glove containing neither cloth lining nor rubber. Unaffected by grease, gasoline, dye, acid, water, etc. 10½ inches long, medium weight.

Size	8	8½	9	9½	10	10½	11
Pair	**$1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**

Goggles

209M1

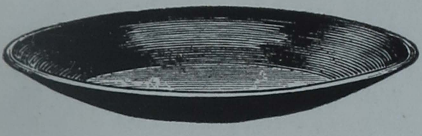


209M2

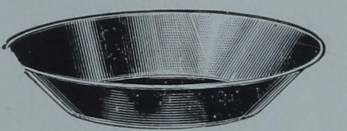
209M1 Goggles, Furnace. Composition frame. Light cobalt blue glass lens for furnace observation. **Pair**..............**$1.75**

209M2 Goggles, Rubber, "Nod and Shake." Gas tight rubber goggles for protecting the eyes of workmen in hazardous places. They fit anybody and the fogging of the glasses is done away with, without removing the goggles from the face. They greatly increase the efficiency of the wearer. Simply put some water in the chambers, and you can look in any direction without the water spilling. The natural movements of the body wash the glasses clear of moisture, but should any gather, nod and shake the head and the fogging is eliminated. **Pair**..........**$1.50**

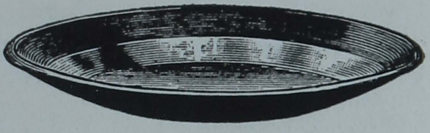
Gold Washing Pans



209M3



209M5



209M6

209M3 Gold Washing Pans. Heavy steel with rolled edges for rigidity.

Diameter, inches	**6**	**12**	**16**
Depth, inches	1⅜	2¼	2½
Each	**$ .40**	**.45**	**.60**

209M4 Gold Washing Pans. Same as 209M3, except aluminum.

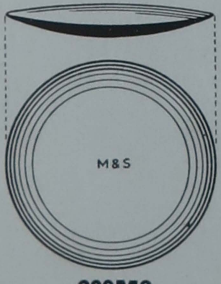
Diameter, inches	**6**	**12**	**16**
Depth, inches	1⅜	2¼	2½
Each	**$1.00**	**1.25**	**1.75**

209M5 Gold Washing Pans. Polished copper.

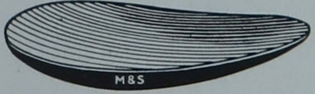
Diameter, inches	**12**	**16**
Depth, inches	2	2½
Each	**$1.50**	**2.75**

209M6 Gold Washing Pans. Made of steel with copper bottom. Diameter, 16½ inches; depth, 2½ inches. **Each**......**$4.00**

209M7 Gold Washing Pans. Same as 209M6, except with inside copper portion silver plated for amalgamation. **Each**..**$6.25**



209M8



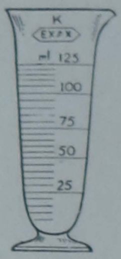
209M9

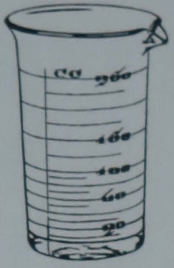
209M8 Gold Pans, Vanning Plaques, Richards. Enameled iron. Diameter, 11 inches. **Each**..........**$1.50**

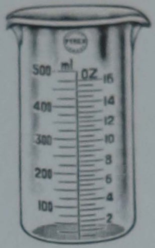
209M9 Gold Washing Horns. Of plain unpolished horn. **Each**..........**$1.75**

209M10 Gold Washing Horns. Of polished steel. **Each**..........**$ .75**

Graduates


210M1


210M3


210M5

210M1 Graduates, Metric, Exax Blue Line, Single Scale. Graduated in ml.

Capacity, ml	5	10	15	30	60	125	250	500	1000
Each	**$ .60**	**.70**	**.60**	**.66**	**.74**	**.92**	**1.30**	**1.96**	**3.12**

210M2, Graduates, Exax Blue Line, Double Scale. Graduated in ounces and ml.

Capacity, ounces	⅛	¼	½	**1**	**2**	**4**	**8**	**16**	**32**
Capacity, ml	5	10	15	30	60	125	250	500	1000
Each	**$ .70**	**.88**	**.65**	**.74**	**.88**	**1.04**	**1.52**	**2.22**	**3.78**

210M3 Graduates, Beaker Shape, Single Scale. Graduated in ml.

Capacity, ml	30	60	125	250	500	1000
Each	**$ .50**	**.60**	**.75**	**.80**	**1.50**	**2.25**

210M4 Graduates, Beaker Shape, Double Scale. Graduated in ounces and ml.

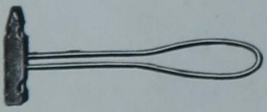
Capacity, ounces	**1**	**2**	**4**	**8**	**16**	**32**
Capacity, ml	30	60	125	250	500	1000
Each	**$ .60**	**.70**	**.85**	**1.00**	**1.60**	**2.40**

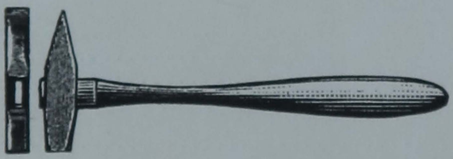
210M5 Graduates, Pyrex, Beaker Shape, Double Scale. Graduated in ounces and ml.

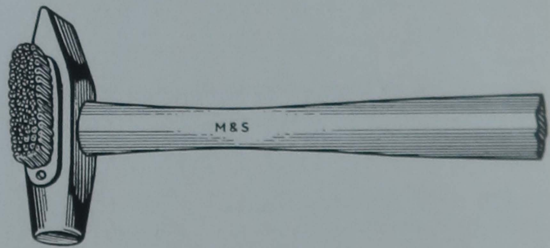
Capacity, ounces	**4**	**8**	**16**	**32**	**64**
Capacity, ml	120	250	500	1000	2000
Each	**$1.20**	**1.50**	**2.00**	**2.80**	**4.20**

Grinders, see crushers and pulverizers, pages 123-129.

Hammers


210M6


210M7



210M8

210M6 Hammers, Plattner's Blow Pipe. Well balanced. For breaking ores and flattening buttons. Head is hardened steel, with riveted steel wire handle. White plate finish. Face, ½ inch square; wedge shaped peen ½ inch wide; total length, 9⅜ inches. Weight, 4 ounces. **Each** .... **$ .95**

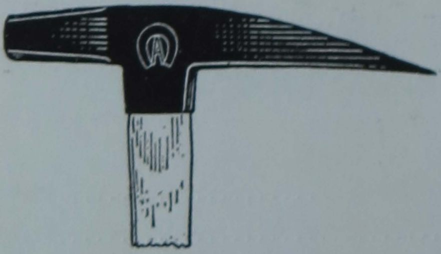
210M7 Hammers, Slagging. Made of superior cast steel with good quality handle.

Weight, ounces	9	12	15	22
Each	**$1.50**	**1.75**	**1.90**	**2.00**

210M8 Hammers, Slagging. With 2¼x½-inch brush screwed to one side of head for cleaning the slag anvil.

Weight, ounces	15	22	26
Each	**$2.75**	**3.00**	**3.25**

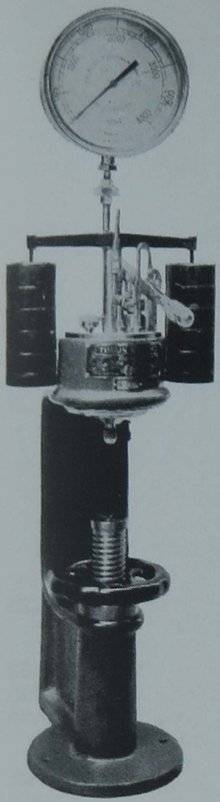
210M9 Extra Brushes. For 210M8. **Each** .... **$ .70**


210M10

210M10 Hammers, Prospecting Picks.

Weight, pounds	**1**	**1½**
Length, overall, inches	13	13
Each	**$1.50**	**1.55**

Hardness Testers



211M1

211M1 Hardness Testers, Brinell, Olsen No. 1. Hand operated, hydraulic. Machine is equipped with a gauge for weighing Brinell load up to 3000 kg. and with weights which act as a safety device as well as a check on the gauge readings.

Main plunger has no packing and is of general construction to reduce friction and afford accuracy and reliability.

A separate V-block, one inch thick, is supplied to be used on top of the flat anvil for holding small rounds.

For use with this machine the Olsen microscope for hardness testing, 211M4, and the Olsen depth measuring instrument, 211M3, are recommended.

Adaptation: gap, or horizontal distance from frame to center of ball, 4 inches. Maximum vertical clearance from flat anvil to ball, 7¼ inches.

Dimensions: length, 15 inches; width, 15 inches; height, 44 inches.

Net weight, 190 pounds.

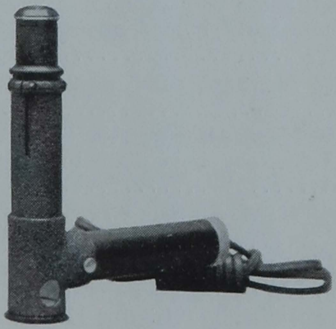
Each..................... **$335.00**

211M2 Hardness Testers, Brinell, Olsen, No. 2. Hand operated, hydraulic. Same as 211M1, except horizontal distance from frame to center of ball is 7½ inches; maximum vertical clearance from flat anvil to ball is 15 inches.

Dimensions. length, 27 inches; width, 15 inches; height, 54 inches. Net weight, 430 pounds. **Each**............ **$390.00**

211M3 Depth Measuring Instruments. For use with 211M1 and 211M2 in the determination of the depth of impression. **Each**................................ **$125.00**

211M4



211M5

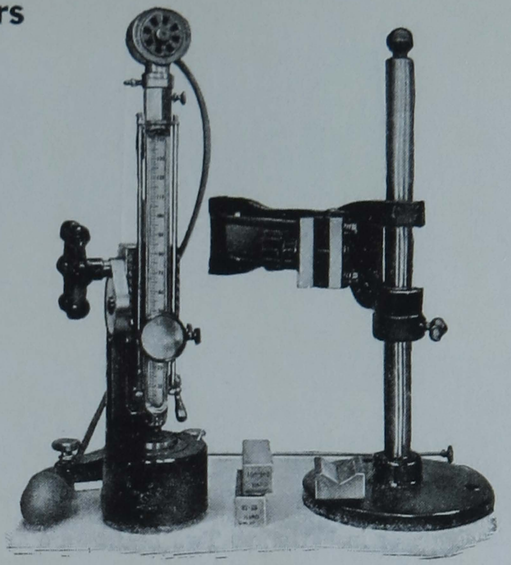
211M4 Hardness Testing Microscopes, Brinell, Olsen. Of illuminated type. Equipped with a small electric bulb and battery.

Use of this microscope will improve the accuracy of the readings and speed up production. Recommended wherever Brinell hardness determinations are made.

Microscope is provided with a porcelain checking scale and substantial wooden case.

Size of case, 9x3x2½ inches. Height of microscope, 8 inches. Net weight, with case, 1½ pounds. **Each**.... **$45.00**

211M5 Hardness Testing Microscopes, Brinell, Olsen. Same as 211M4, except with attachment for use from 110 volts, 60 cycle, single phase alternating current. **Each** **$60.00**



211M6

211M6 Hardness Testers, Shore's Scleroscopes, Model C-2.

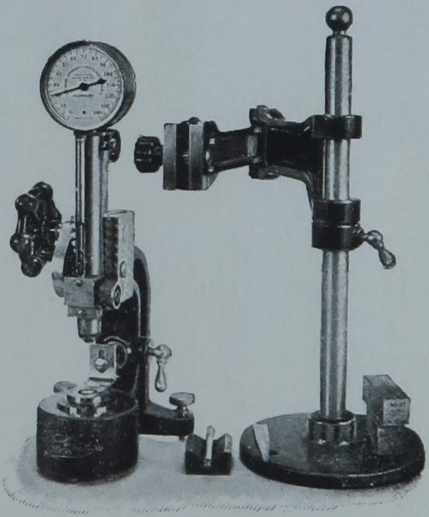
The Scleroscope is **an instrument for measuring the hardness of metals** from the softest lead to the most intensely hard steel, without special adjustments. The readings are obtained in a moment and several thousand tests can be made in a day.

It is adapted for measuring metal as thin as foil, up to objects of unlimited size.

Complete outfit, Model C-2, adapted to universal application consists of:

The scleroscope (self-contained).
One hardened V block.
One nickeled and enameled swing arm and post.
One diamond Universal hammer.
One magnifier hammer (for soft metals only).
One soft and one hard steel reference bars.
Fifty blank curve charts.
One polished hardwood and nickeled carrying case.

Complete.. **$275.00**



211M7

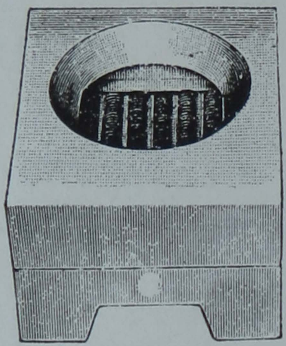
211M7 Hardness Testers, Shore's Scleroscopes, Model D. For measuring the hardness of metals.

Complete outfit adapted to universal application, consists of:

One standard scleroscope (self-contained).
One hard and one soft master block of known hardness.
One hardened steel V block.
One nickeled and enameled swing bracket and post.
One diamond Universal hammer.
One hammer lifter fork.
One rubber covered cleaning rod.
One polished mahogany and nickeled carrying case.

Complete.................................. **$295.00**

Heaters



212M1

212M1 Heaters, Electric, Gilmer. Constructed of interlocking asbestos blocks, heat-resistant and not attacked by acid fumes and solutions common in the laboratory. Parts are interchangeable. Supplied for use on 110 volts and may be connected singly or in batteries. Two heaters are connected in series for use on 220 volts. The advantage of supplying 110-volt heaters lies in the fact that larger resistance wire may be used and longer life results.

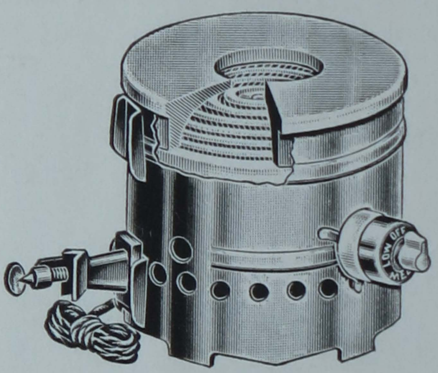
Specifications: length, 6 inches; width, 5 inches; height, 3½ inches; diameter of hole, 4 inches; current consumption, 600 watts. **Complete**............................**$5.00**

212M2 Heating Units. Complete, including coil and porcelain plate. **Each**................................**$1.50**

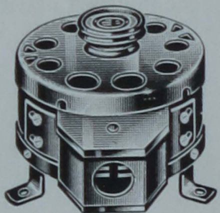
212M3 Heating Coils, Only. Without porcelain plate. **Each**..**$1.00**

212M4 Cover Plate, Only. Each..................**$1.60**

212M5 Base, Only. Each.........................**$1.90**



212M6



212M9

212M6 Heaters, Electric, Heavy Duty. With 3-heat switch control. Replaceable elements are of durable nickel chromium alloy; retained in a porcelain plate. Heavy asbestos insulation below elements arrests downward radiation. Case and wiring terminals are of Monel metal. A pair of sockets welded to the base accommodate a clamp for supporting the heater on a rod; or, a rod may be supported above the heater. Dimensions of case: diameter, 7¾ inches; height, 7¾ inches. Regularly furnished with top refractory having 3⅛-inch hole; other sizes optional as listed below. Complete with cord and support rod holder.

Watts	880	1200	1500
Each	**$25.00**	**25.00**	**25.00**

212M7 Heating Units, Only.

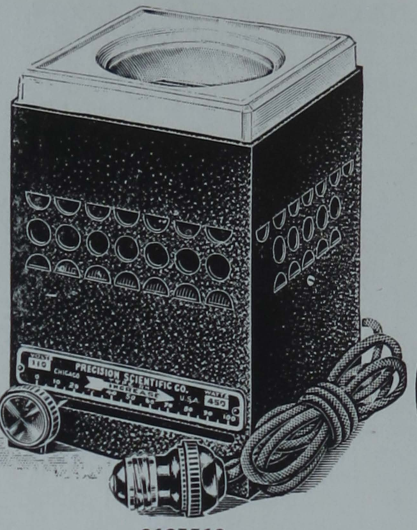
Complete	**$3.00**	**3.00**	**3.00**

212M8 Top Refractories, Only.

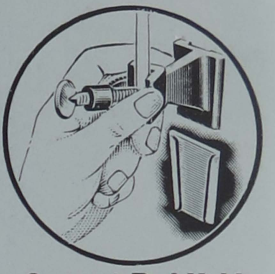
Diameter of opening, inches	3⅛	2	6
Each	**$4.00**	**4.00**	**4.00**

212M9 Rheostats, Electric, Heavy Duty. Recommended for use with 212M6. Double rolling contact; insulated shaft; terminals and all live parts enclosed in steel case. Complete with canopy for cord, conduit or cable connection and mounting legs.

Volts	**110**	**220**
Ohms	8	30
Each	**$17.50**	**17.50**



212M10



Support Rod Holder

Heaters, Electric. With built-in rheostat control. For tests requiring close temperature control. By means of the built-in rheostat, temperature duplications are achieved with ease and certainty. Rheostat may be set quickly to the maximum heat position in order to bring up the temperature. When the desired temperature has been reached, rheostat may be adjusted to maintain the required test temperature. Rheostat settings are indicated by the control arm as it moves along the scale. Refractory tops are interchangeable. For A. C. or D. C. Current consumption, 550 watts. Dimensions: 5 inches square; 7½ inches high. Complete with support rod holder which fits into two sockets welded to back of stainless steel heater case.

212M10 Heaters, Electric. For general laboratory work, especially recommended for use with Kjeldahl equipment for nitrogen determinations. Refractories are beveled around opening and have raised edges. Refractory hole diameter, 3⅛ inches. For 110 volts. **Each**...................**$15.00**

212M11 Heaters. Same as 212M10, except for 220 volts. **Each**..**$15.00**

212M12 Heaters, Electric, A. S. T. M. D-86 and D-216. For distillation of gasoline and similar petroleum products. With refractory hole diameter, 1¼ inches. For 110 volts. **Each**..**$15.00**

212M13 Heaters. Same as 212M12, except for 220 volts. **Each**..**$15.00**

212M14 Heaters, Electric, A. S. T. M. D-86 and D-216. With refractory hole diameter, 1½ inches. For 110 volts. **Each**..**$15.00**

212M15 Heaters. Same as 212M14, except for 220 volts. **Each**..**$15.00**

212M16 Heaters, Electric. Refractory is of Heat-Roc board with 1-inch diameter opening, as generally required for benzol distillations. For 110 volts. **Each**........**$15.00**

212M17 Heaters. Same as 212M16, except for 220 volts. **Each**..**$15.00**

212M18 Heaters, Electric, A. S. T. M. D-158. Refractory is of Heat-Roc board, with 2¾-inch diameter opening. For 110 volts. **Each**..............................**$15.00**

212M19 Heaters. Same as 212M18, except for 220 volts. **Each**..**$15.00**

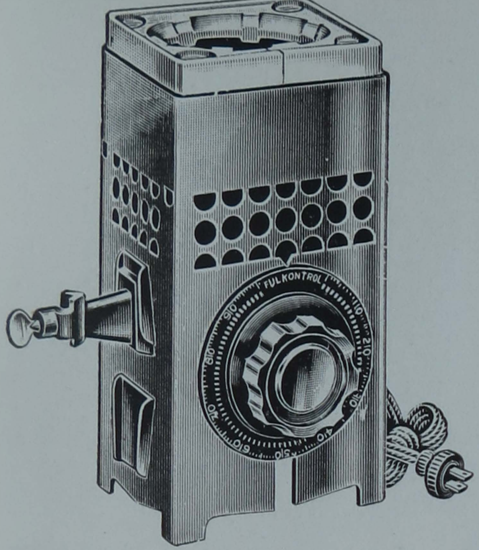
212M20 Heaters, Electric, A. S. T. M. D-92. Refractory assembly consists of a cast-iron plate covered by a Heat-Roc board. Plate and board contain 2 3/16-inch and 2 11/16-inch diameter openings, respectively. For 110 volts. **Each**....**$16.50**

212M21 Heaters. Same as 212M20, except for 220 volts. **Each**..**$16.50**

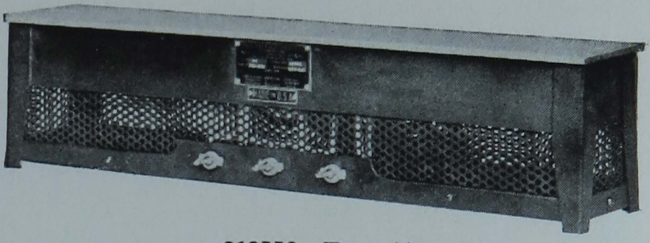
212M22 Elements, Only. Complete unit. For any of above heaters. For 110 volts. **Each**......................**$2.85**

212M23 Elements, Only. Same as 212M22, except for 220 volts. **Each**..................................**$2.85**

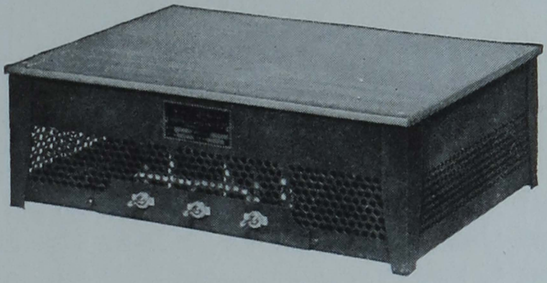
Heaters, Continued



213M1



213M2—Type 44



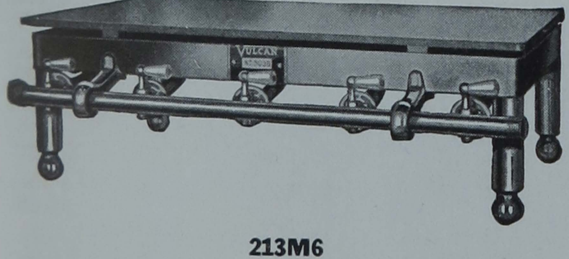
213M2—Type 22

213M1 Heaters, Electric, Ful Kontrol. For such applications as the distillation of motor fuels, high boiling point oils and Cleveland open cup flash and fire tests. Will withstand continuous duty and is adaptable to a wide variety of laboratory heating operations. Contains a built-in auto-transformer utilizing a single layer winding traversed by a movable carbon contact, and offers almost stepless heat control from 0 to 750 watts. Has a stainless steel case, replaceable heating elements, and laboratory-proof wiring. Employs no rheostat. Regularly furnished with top refractory having a 3⅛-inch hole, but available with tops conforming to various A. S. T. M. and distillation requirements at no extra charge. Complete for 110 volts, 50 to 60 cycles A. C. Dimensions: 4¾ inches square; 9 inches high. **Each**.................. **$35.00**

213M2 Hot Plates, Electric, Multiple Unit. Coils radiate directly to the top plate. This results in a maximum amount of the heat generated being forced to the top of plate. while a relatively low temperature is preserved on the under side of the apparatus. Constructed to operate on either 110 or 220 volts by an external switching of connections. Each type is provided with three toggle switches mounted on the base, each of which controls one of the three heating coils. At each of three heats even temperature is obtained over the whole of top surface, owing to the uniform distribution of heating elements.

Type	**12**	**20**	**22**	**30**	**32**	**40**	**44**
Size, inches	12½x12¼	12⅜x17⅞	17⅞x12⅜	17⅞x23⅞	23⅞x17⅞	17⅞x5⅝	23¾x4⅝
Switches located on	12¼ Edge	12⅜ Edge	17⅞ Edge	17⅞ Edge	23⅞ Edge	17⅞ Edge	23¾ Edge
Weight, net, pounds	25	40	40	70	70	23	21
Weight, shipping, pounds	35	55	55	110	110	28	30
Max. temp., degrees, F.	750	750	750	750	750	750	450
Max. wattage	1200	1800	1800	3600	3600	1200	600
Each	**$37.50**	**50.00**	**50.00**	**70.00**	**70.00**	**32.50**	**32.50**
213M3 Heating Units, Only.							
Number required per hot plate	2	2	2	4	4	2	2
Each Unit	**$4.00**	**5.00**	**5.00**	**5.00**	**5.00**	**4.00**	**4.00**
213M4 Refractories, Only.							
Number required per unit	1	2	2	2	2	1	1
Each Refractory	**$1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**

213M5 Coiled Wires, Only. (Three required per unit.)¶Specify type of hot plate. **Each Coil**.................. **$1.00**



213M6

213M6 Hot Plates, Gas. Black finish; plain top; height, 9½ inches. Burners are removable for cleaning purposes. Surface evenly heated. Gas consumption per burner, 12,000 B. t. u.'s per hour. When ordering, specify whether for natural or artificial gas.

Number of burners	**1**	**2**	**4**	**5**	**6**	**8**
Width and depth, inches	7x18	14x18	24x18	30x18	36x18	48x18
Weight, shipping, pounds	35	60	90	110	130	170
Each	**$8.75**	**13.00**	**17.50**	**22.75**	**28.25**	**37.25**

213M7 Hot Plates, Gasoline. Same as 213M6, except equipped with 57M13 gasoline burners. Without fuel tank or piping. See page 60 for gasoline pressure tanks.

Burners, number	1	2	4	5	6	8
Each	**$14.75**	**25.00**	**41.50**	**52.75**	**64.25**	**85.25**

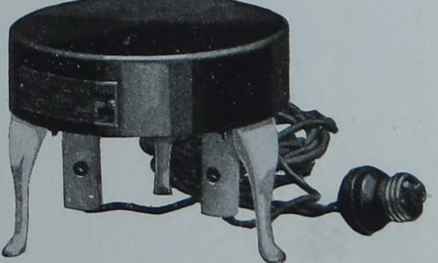
Hot Plates, Circular. For hard continuous service. Spiral heating unit of Chromel wire wound on heat resistant refractory. Operates on A. C. or D. C. Draws 100 watts. Maximum temperature, 900° F. Plate diameter, 6 inches. Furnished with 6 feet of twin-conductor flexible cord and detachable connector plugs. Use of 5-ampere snap or knife switch required.

213M8 Hot Plates, Circular, 110 Volts. Each.................. **$11.00**

213M9 Hot Plates, Circular, 220 Volts. Each.................. **$11.00**

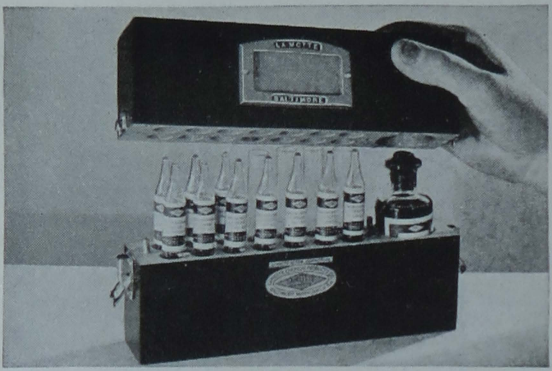
213M10 Extra Heating Unit for 110 Volts. Each.................. **$3.25**

213M11 Extra Heating Unit for 220 Volts. Each.................. **$3.25**



213M8

Hydrogen-Ion (pH) Apparatus



214M1

Block Comparators, La Motte. Portable outfits for pH determinations in the plant or laboratory. Also used in ore mills for pH of circuit. Available for any desired range from 0.2 to 13.6 pH in that any number of standards may be added in series according to the range to be covered. Determinations can be made on turbid or colored liquids by compensating for the color or turbidity present with tubes of the unknown in front of the standards.

A single block comparator unit consists of one set of La Motte color standards, 4 test tubes graduated at 10 ml., a 50 ml. bottle of the corresponding indicator solution, a 0.5 ml. pipette for measuring the indicator solution, and complete instructions. The equipment is contained in a polished wood case, 8 inches long by 2 inches wide by 5¾ inches high. The top of the case serves as a comparator. When not in use the top is placed over the tubes and fastened down, completely protecting the contents of the set.

Name	pH Range	Each
214M1 Acid Cresol Red	0.2–1.8	**$12.50**
214M2 Meta Cresol Purple	1.2–2.8	**12.50**
214M3 La Motte Yellow	2.6–4.2	**12.50**
214M4 Alpha (2:4) Dinitrophenol (Spec.)	2.8–4.4	**13.25**
214M5 Bromphenol Blue	3.0–4.6	**12.50**
214M6 Bromcresol Green	3.8–5.4	**12.50**
214M7 Gamma (2:5) Dinitrophenol (Spec.)	4.2–5.8	**13.25**
214M8 Methyl Red	4.4–6.0	**12.50**
214M9 Bromcresol Purple	5.2–6.8	**12.50**
214M10 Chlorphenol Red	5.2–6.8	**12.50**
214M11 Para Nitrophenol (Special)	5.4–7.0	**$13.25**
214M12 Bromthymol Blue	6.0–7.6	**12.50**
214M13 Phenol Red	6.8–8.4	**12.50**
214M14 Meta Nitrophenol (Special)	7.2–8.8	**13.25**
214M15 Cresol Red	7.2–8.8	**12.50**
214M16 Thymol Blue	8.0–9.6	**12.50**
214M17 La Motte Oleo Red B	8.6–10.2	**12.50**
214M18 La Motte Purple	9.6–11.2	**12.50**
214M19 La Motte Sulfo Orange	11.0–12.6	**12.50**
214M20 La Motte Violet	12.0–13.6	**12.50**

214M21 Set of 9 Ampoules of Color Standard and 1 Ampoule of Distilled Water. In any above range. **Set** **$5.00**

214M22 Ampoule of Distilled Water. Each .... **$ .15**

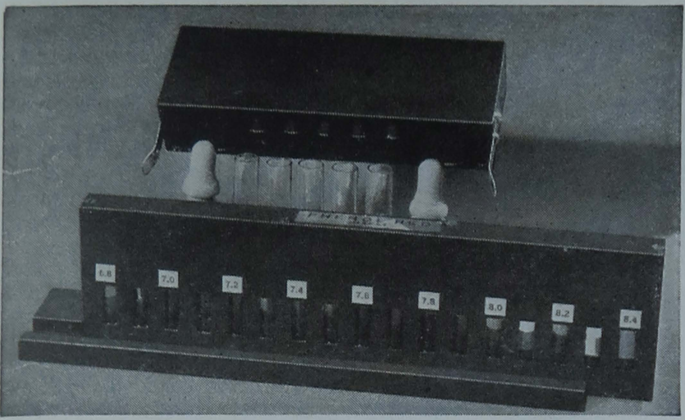
214M23 Pipette. 0.5 ml. With rubber bulb. **Each** .... **$ .25**

214M24 Test Tube. Marked at 10 ml. **Each** .... **$ .15**

Indicator Solutions, La Motte. Especially prepared for use in La Motte Block Comparators and colorimetric hydrogen-ion outfits. They are made from the purest chemicals; carefully standardized; furnished in Pyrex bottles. They are available from the range 0.2 pH to 13.6 pH

Name	pH Range	% Concentration	50 ml. Bottle	100 ml. Bottle	500 ml. Bottle	1000 ml. Bottle
214M25 Acid Cresol Red	0.2–1.8	0.02	**$ .75**	**$1.00**	**$3.30**	**$6.00**
214M26 Meta Cresol Purple	1.2–2.8	0.04	**.75**	**1.25**	**3.50**	**6.50**
214M27 Thymol Blue	1.2–2.8	0.04	**.75**	**1.00**	**3.30**	**6.00**
214M28 La Motte Yellow	2.6–4.2	....	**.75**	**1.00**	**3.30**	**6.00**
214M29 Alpha (2:4) Dinitrophenol	2.8–4.4	0.08	**.75**	**1.00**	**2.50**	**4.00**
214M30 Bromphenol Blue	3.0–4.6	0.04	**.75**	**1.00**	**3.30**	**6.00**
214M31 Methyl Red	4.4–6.0	0.02	**.75**	**1.00**	**2.50**	**4.00**
214M32 Bromcresol Green	3.8–5.4	0.04	**.75**	**1.25**	**3.50**	**6.50**
214M33 Gamma (2:5) Dinitrophenol	4.2–5.8	0.1	**.75**	**1.25**	**3.50**	**6.50**
214M34 Bromcresol Purple	5.2–6.8	0.04	**.75**	**1.00**	**3.30**	**6.00**
214M35 Chlorphenol Red	5.2–6.8	0.04	**.75**	**1.25**	**3.50**	**6.50**
214M36 Paranitrophenol	5.4–7.0	0.30	**.75**	**1.00**	**2.50**	**4.00**
214M37 Bromthymol Blue	6.0–7.6	0.04	**.75**	**1.00**	**3.30**	**6.00**
214M38 Phenol Red	6.8–8.4	0.02	**.75**	**1.00**	**3.30**	**6.00**
214M39 Meta Nitrophenol	7.2–8.8	1.00	**.75**	**1.25**	**4.75**	**9.00**
214M40 Cresol Red	7.2–8.8	0.02	**.75**	**1.00**	**3.30**	**6.00**
214M41 Thymol Blue	8.0–9.6	0.04	**.75**	**1.00**	**3.30**	**6.00**
214M42 La Motte Oleo Red B	8.6–10.2	....	**.75**	**1.00**	**3.30**	**6.00**
214M43 La Motte Purple	9.6–11.2	....	**.75**	**1.00**	**3.30**	**6.00**
214M44 La Motte Sulfo Orange	11.0–12.6	....	**.75**	**1.00**	**3.30**	**6.00**
214M45 La Motte Violet	12.0–13.6	....	**.75**	**1.00**	**3.30**	**6.00**

Hydrogen-Ion (pH) Apparatus, Continued



215M9

Slide Comparators, Taylor. For hydrogen-ion determinations with solution standards. Set consists of two principal parts, the slide and the base. The slide is a plastic case 10 inches long, 2¾ inches high and ⅝ inches thick. It contains 17 vertical holes and 17 horizontal slots which pass through the exact centers of the holes. In the holes are placed nine color standards for any given indicator and eight ampoules of distilled water with which color standards alternate. The base also is moulded from plastic and consists of two parts. The lower contains slot for the slide fitted with a key to stop the slide at the end of the standards, two holes holding vials of indicator solution, with 0.5 ml. pipettes and nipples, five holes enclosing test tubes, and a closed compartment containing a ground-glass plate. Horizontal slots run through the three central holes in the base holding the test tubes, these slots corresponding exactly with any three of the slots in the slide. The upper part of the base serves as a cover for the vials and test tubes when the set is not in use. It is fastened to the lower part by means of spring catches. Complete set, including slide, is 10 inches long, 2⅛ inches wide, 4 inches high. Weight, 2 pounds.

	Name	pH Range	Each
215M1	Acid Cresol Red	0.2–1.8	**$15.00**
215M2	Acid Mesol Cresol Purple	1.2–2.8	**15.00**
215M3	Benzo Yellow	2.4–4.0	**15.00**
215M4	Bromphenol Blue	3.0–4.6	**15.00**
215M5	Bromcresol Green	3.8–5.4	**15.00**
215M6	Methyl Red	4.4–6.0	**15.00**
215M7	Chlorphenol Red	5.2–6.8	**15.00**
215M8	Bromthymol Blue	6.0–7.6	**15.00**
215M9	Phenol Red	6.8–8.4	**15.00**

	Name	pH Range	Each
215M10	Cresol Red	7.6–8.8	**$15.00**
215M11	Meta Cresol Purple	7.6–9.2	**15.00**
215M12	Thymol Blue	8.0–9.6	**15.00**
215M13	Phthalein Red	8.6–10.2	**15.00**
215M14	Tolyl Red	10.0–11.6	**15.00**
215M15	Acyl Red	10.0–11.6	**15.00**
215M16	Parazo Orange	11.0–12.6	**15.00**
215M17	Acyl Blue	12.0–13.6	**15.00**

Accessories and Replacement Parts

215M18 Slides, Only. Includes set of color standards with distilled water ampoules and vial of indicator solution, and pipette, in any range in above list. **Complete** **$7.50**

215M19 Single Color Standards. Each .... **$ .50**

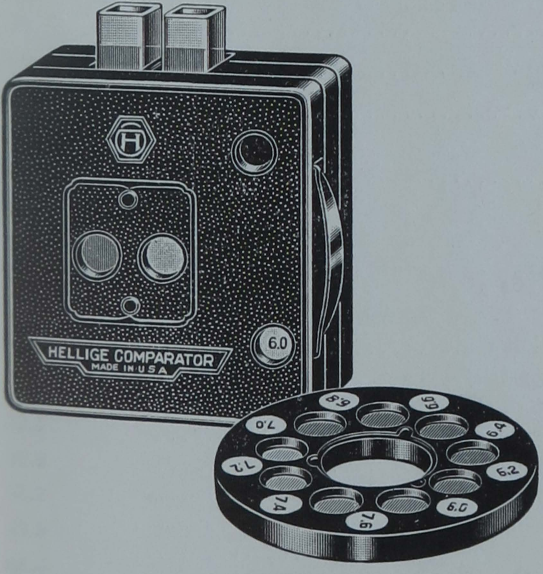
215M20 Vials of Indicator Solution. Each .... **$ .50**

215M21 Ampoules of Distilled Water. Each .... **$ .15**

215M22 Empty Indicator Vials. Each .... **$ .15**

215M23 Test Tubes, 5 ml. Each .... **$ .15**

215M24 Pipettes, 0.5 ml. Each .... **$ .15**



215M25

215M25 Pocket Model Comparators, Hellige. Handy, small instrument for accurate hydrogen-ion (pH) measurements using colored glass discs instead of liquid standards. Housing is made of durable, corrosion-resistant Textolite. Consists of three parts, held together by spring hinges. Front cover encloses the color disc. In the back are compartments for all other parts necessary for a test, namely, two square test tubes, a pipette with rubber nipple and a bottle of indicator solution or reagent. One tube is to receive the test solution; the other, to be used to offset any color or turbidity which may be present in the solution under test, and which would prevent an accurate color match. The size of the complete apparatus, including color disc, is 3¾x3¾x1½ inches (95x95x40 mm.). Complete with two graduated square test tubes, 50 ml. bottle of indicator solution, and one color disc. When ordering, **select color disc from listing on page 216. Each** **$25.00**

215M26 Prism Attachment. With magnifying lens for attaching to 215M25. **Each** **$10.00**

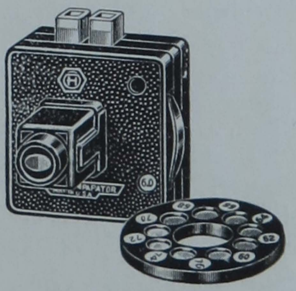
Accessories and Replacement Parts

215M27 Test Tubes, Square. Graduated from 5 to 10 ml. in 1 ml. Viewing depth, 13 mm. **Each** **$1.40**

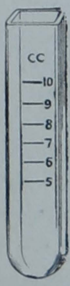
215M28 Test Tubes, Square. Same as 215M27, except ungraduated. **Each** .... **$ .90**

215M29 Pipettes, Dropping. For measuring indicator solutions or reagents. With rubber nipple. Graduations at 0.2, 0.25 and 0.5 ml. **Each** .... **$ .75**

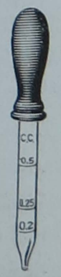
215M30 Bottles, Rectangular. For indicator solution. With Bakelite screw cap. **Each** .... **$ .30**



215M25
With Prism Attachment

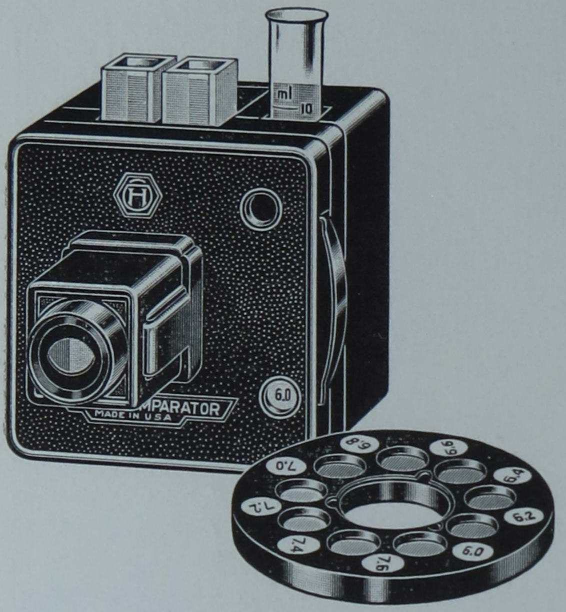


215M27

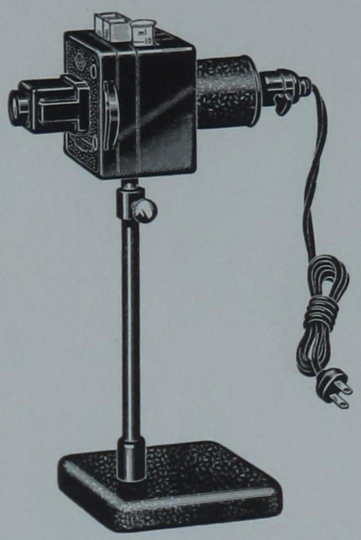


215M29

Hydrogen-Ion (pH) Apparatus, Continued



216M1



216M1 With Stand and Lamp

216M1 Comparators, Hellige Standard Model. For making accurate pH measurements by the color comparison method. Housing is molded of durable corrosion-resistant Textolite. Has a hinged cover which encloses color disc, and is provided with openings which permit the use of cells or tubes of viewing depth up to 40 mm. One cell is to receive the test sample; the other, to be used to offset any color or turbidity which may be present in the solution under test and which would prevent an accurate color match. This arrangement provides also for a color comparison of similar media (viz., liquid against liquid), and permits the testing of highly colored or turbid liquids as well as clear solutions.

Complete with dust-proof enclosed prism, 2 acid-proof cemented plane and parallel glass cells, one measuring tube, one graduated pipette, 50 ml. of the necessary indicator solution and one color disc. When ordering, **specify color disc from listing below. Each**.......... **$40.00**

Accessories and Replacement Parts

216M2 Metal Stand. Consists of heavy iron base, finished in crystal black, with adjustable chromium-plated rod. **Each**.. **$7.50**

216M3 Electric Lamp. With blue daylight filter plate, bulb for 110 volts, cord and plug. **Complete**................ **$6.00**

216M4 Cell, Square. Acid-proof cemented. With plane and parallel walls. Viewing depth, 13 mm. **Each**........... **$5.60**

216M5 Cell, Rectangular. Acid-proof cemented. With plane and parallel walls. Viewing depth, 40 mm. **Each**..... **$6.00**

216M6 Tube, Square. Can be used in place of the cemented cell, 216M4, and is recommended for routine work or for solutions which are difficult to wash out of the more delicate cemented cells. Tube can be cleaned easily in any solvent or by boiling if the heat is raised gradually. Viewing depth, 13 mm. **Each**.............................. **$2.25**

216M7 Tube, Square. Same as 216M6, except graduated from 5 to 10 ml. in 1 ml. **Each**.............................. **$2.75**

216M8 Tube, Rectangular. Viewing depth, 26 mm. **Each**.............................. **$1.25**

216M9 Tube, Round. For measuring the test sample in using ungraduated cells. Graduated from 5 to 10 ml. in 1 ml. **Each**.............................. **$ .75**

216M10 Pipette. For measuring indicator solutions or reagents. With graduations at 0.2, 0.25, 0.5, and 1.0 ml. **Each**.. **$1.60**

Color Discs for Hellige Comparators. Steps of 0.2 pH

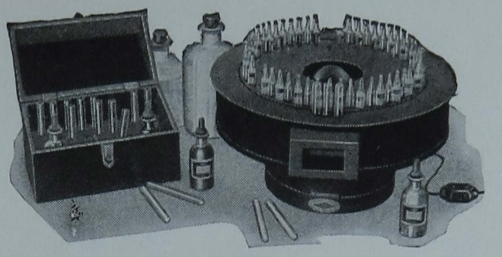
	Name	pH Range
216M11	Acid Cresol Red	0.2-1.8
216M12	Methyl Violet I	0.2-1.8
216M13	Meta Cresol Purple	1.2-2.8
216M14	Thymol Blue, acid	1.2-2.8
216M15	Methyl Violet II	1.8-3.2
216M16	Beta Dinitrophenol	2.2-3.8
216M17	Hellige Orange	2.6-4.2
216M18	Alpha Dinitrophenol	2.8-4.4
216M19	Bromphenol Blue	3.0-4.6
216M20	Gamma Dinitrophenol	4.0-5.4
216M21	Bromcresol Green	4.0-5.6
216M22	Methyl Red	4.4-6.0
216M23	Bromcresol Purple	5.2-6.6
216M24	Chlorphenol Red	5.2-6.8
216M25	Chlorphenol Red, special for nickel solutions	5.2-6.8
216M26	Para Nitrophenol	5.4-7.0
216M27	Bromthymol Blue	6.0-7.6
216M28	Amino Red	6.8-8.0
216M29	Meta Nitrophenol	6.8-8.4
216M30	Phenol Red	6.8-8.4
216M31	Alpha Naphtholphthalein	7.0-8.6
216M32	Cresol Red	7.2-8.8
216M33	Thymol Blue, alkaline	8.0-9.6
216M34	Cresol Phthalein, ortho	8.4-9.8
216M35	Phenol Phthalein	8.6-10.2
216M36	Thymol Phthalein	9.4-10.6
216M37	Purple	10.0-11.4
216M38	Nitro Yellow	10.0-11.6
216M39	Alizarin Yellow GG	10.2-11.8
216M40	Alizarin Yellow R	10.4-12.0
216M41	Hellige Alkali	10.4-12.0
216M42	Sulfo Orange	11.2-12.6
216M43	Tropaeolin O	11.2-12.8
216M44	Violet	12.0-13.6

Each color disc, as listed above, including 50 ml. bottle of indicator solution.............................. **$17.50**

216M45 Indicator Solution. For above color discs. When ordering specify indicator desired.

Capacity of bottle, ml.	50	100	500	1000
Each	**$ .75**	**1.00**	**3.00**	**5.00**

Hydrogen-Ion (pH) Apparatus, Continued



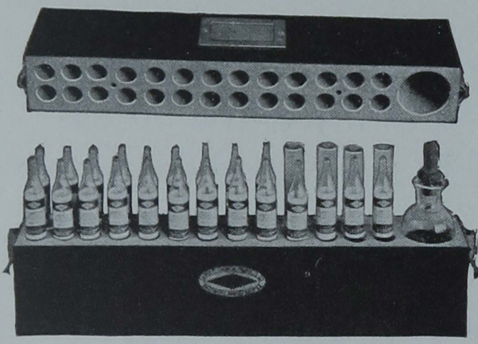
217M1

217M1 Comparators, La Motte, Roulette. Fills the need for a permanent installation for colorimetric pH control. Covers an extended pH range and gives a maximum of convenience, accuracy and speed. Determinations are made with an accuracy of 0.1 pH. Comparator is provided with a special illuminated field so that uniform results may be obtained by day or night.

Comparator element consists of a stationary wood base and an upper metal shell holding the revolving drum. The color standards are permanently held in the revolving drum and move before the eyepiece which is attached to the front of the unit. A Mazda light for 110 volts provides illumination for the special "dalite" field arrangement.

The unit contains three sets of permanent color standards: Chlorphenol Red, pH 5.2-6.8; Bromthymol Blue, pH 6.0-7.6; Phenol Red, pH 6.8-8.4; and 24 ampoules of distilled water. An extra polished wooden case, containing 50 ml. bottles of the three corresponding indicator solutions, three 0.5 ml. pipettes with nipples and 18 marked test tubes, is included as part of the equipment. A fabrikoid cover for the roulette comparator also is supplied. Full instructions accompany each set. **Complete**........**$75.00**

217M2 Comparators, La Motte, Roulette. Same as 217M1, except with any three sets of color standards, selected from those listed on page 214, (see 214M21). **Each**........................**$75.00**

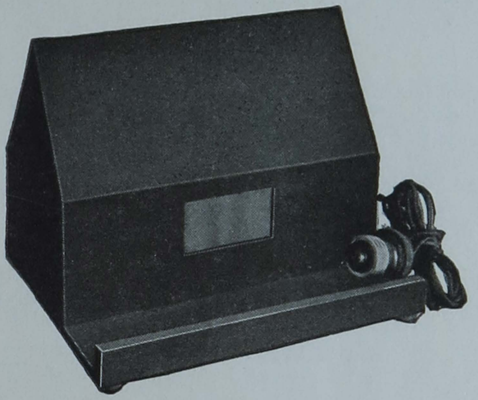


217M3

217M3 Comparators, La Motte, Utility, Wide Range. A special block comparator employing La Motte Utility Indicator covering the range 3.0–10.5, with standards in intervals of 0.5 pH unit. The single indicator ranges from bright red at pH 3.0 through orange to yellow, to yellowish green, to green, to greenish blue, to blue and to purple at 10.5 pH. Determinations can be made over the full range with an accuracy of 0.25 pH. **Each**........................**$27.50**

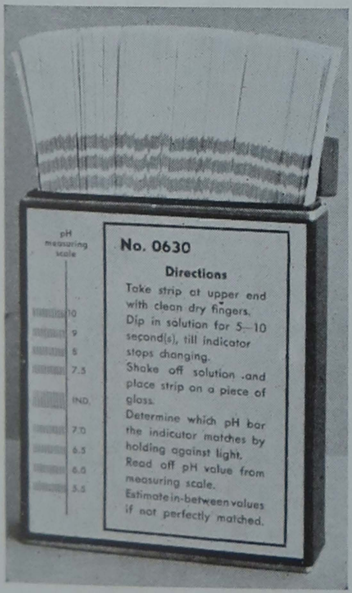
217M4 Color Standard. Specify pH value. **Each**..**$ .90**

217M5 Indicator Solution. 100 ml. bottle. **Each**..**$ 1.50**



217M6

217M6 Comparator Lamps, La Motte, Dalite. For use with La Motte Block Comparators, see 214M1, and other sets as the source of light for making readings at night and in places where ordinary daylight is not of uniform intensity. Box contains a special lamp, a rack to hold the comparator block, and a piece of "dalite" glass, so arranged that when the comparator block is placed in the rack, the slots in the block are directly in front of the "dalite" glass. Furnished for 110 volts. **Complete**........................**$7.50**

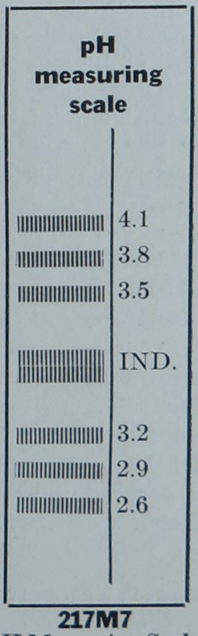

pH
measuring
scale
10
9
8
7.5
IND.
7.0
6.5
6.0
5.5
No. 0630
Directions
Take strip at upper end with clean dry fingers.
Dip in solution for 5—10 second(s), till indicator stops changing.
Shake off solution and place strip on a piece of glass.
Determine which pH bar the indicator matches by holding against light.
Read off pH value from measuring scale.
Estimate in-between values if not perfectly matched.

217M7

217M7 Hydrogen-Ion Papers (pH). Impregnated with a highly sensitized indicator and with a number of control bars, each bar being of a different color and representing steps of 0.3 pH. When these strips of paper are dipped into a solution the indicator will change color and by comparison with the colors of the control bars, the pH value can be determined. The following are for general application. They have one indicator and either 6 or 8 control-colors on each strip. pH range 2.6-4.1, 3.9-5.4, 5.2-6.7, 6.0-7.5, 6.6-8.1, 8.2-9.7. **Box** of 200 strips (Specify pH range)........................**$5.00**

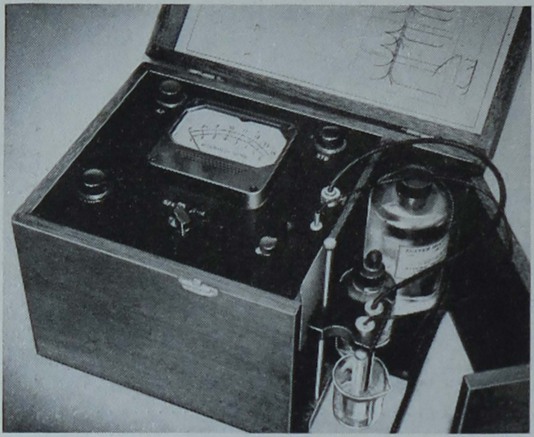
217M8 Hydrogen-Ion Papers (pH). Similar to 217M7, but especially for the beet sugar industry.

pH range	11.0-12.4	10.8-11.2	10.6-10.9
CaO range	......	0.065-0.08	0.055-0.07
Box of 200 strips	**$3.00**	**3.00**	**3.00**
pH range, continued	9.7-10.1	9.3-9.8	8.9-9.5
CaO range	0.03-0.04	0.02-0.035	0.01-0.025
Box of 200 strips	**$3.00**	**3.00**	**3.00**
pH range, continued	8.0-8.9	6.0-8.0	5.0-7.5
CaO range	0.00-0.01	....	....
Box of 200 strips	**$3.00**	**3.00**	**3.00**


pH
measuring
scale
4.1
3.8
3.5
IND.
3.2
2.9
2.6

217M7
pH Measuring Scale

Hydrogen-Ion (pH) Apparatus, Continued



218M1

218M1 pH Meters, Industrial Model M, Beckman. The meter reads directly in pH by pressing a button on the panel. Continuous pH indication is obtained by locking the button in the "down" position.

Designed especially for industrial use. The electrode system consists of a shielded glass electrode for measurements outside the instrument, and a saturated calomel electrode.

The instrument is entirely self-contained with batteries inside the case. The double scale meter covers the acid range, 0 to 7 pH, and the alkaline range, 7 to 14 pH, with readings to 0.02 pH unit.

Dimensions: length, 13½ inches; depth, 9¼ inches; height, 9 inches. Weight, 23 pounds. Complete with glass and calomel electrodes, accessories, and full directions.
Each..$150.00

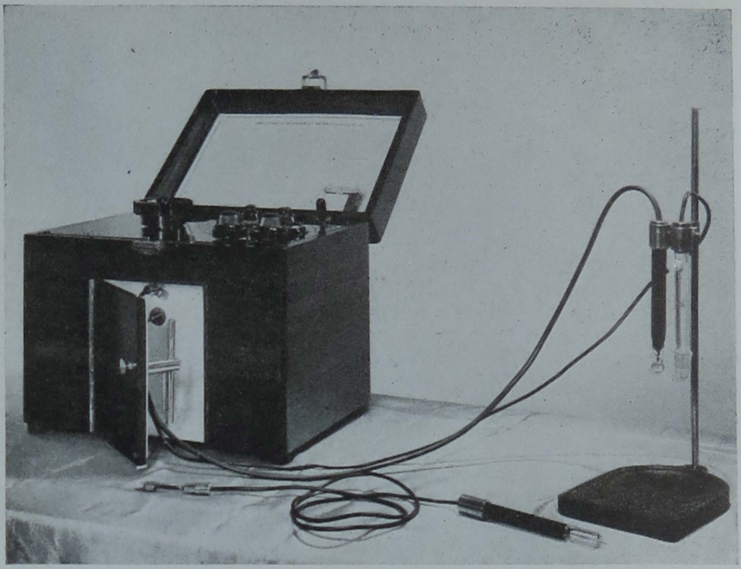
Note: For flow type and immersion type electrode assemblies see 219M6 and 219M7 on next page.

Replacement Parts for 218M1

218M2 Glass Electrode. 5-inch; shielded. With 12-inch cable. **Each**..$7.50
218M3 Extra Cable. For 218M2. **Foot**..............$ .20
218M4 Calomel Electrode. 5-inch; sealed. With 12-inch lead. **Each**..$7.50
218M5 Extra Lead. For 218M4. **Foot**..............$ .05
218M6 Glass Sleeve. For 218M4. **Each**............$1.50
218M7 Electrode Holder. **Each**....................$1.50
218M8 Drain Plate. **Each**..........................$ .50
218M9 Electronic Tube, No. 32. **Each**..............$1.75
218M10 Electronic Tube, No. 49. **Each**.............$1.35
218M11 Complete Set of Batteries. **Set**.............$4.75
218M12 Short-Circuit Strap. (For making EMF measurements and oxidation-reduction titrations with 218M1.) **Each**..$ .50
218M13 Thermometers, Range, 0° to 50° C. **Each**....$2.50
218M14 Support Stand. For 218M7. **Each**..........$1.00

Solutions for pH Meters

218M15 Buffer Mixture, pH 3.98. 100 ml. dropper bottle. **Each**..$1.25
218M16 Buffer Mixture, pH 3.98. 1-pint bottle. **Each** $3.00
218M17 Buffer Mixture, pH 7.00 1-pint bottle. **Each** $3.00
218M18 Buffer Mixture, pH 10.0. 1-pint bottle. **Each** $3.00
218M19 KC1 Solution, Saturated. 50 ml. dropper bottle. **Each**..$ .35
218M20 KC1 Solution, Saturated. 100 ml. dropper bottle. **Each**..$ .60
218M21 Thermometers, 0° to 50° C. 12 mm. immersion. **Each**..$2.50
218M22 Support Stand. For 218M7. **Each**..........$1.00



218M23

218M23 pH Meters, Laboratory Model G. Beckman. For making accurate pH determinations on practically all substances regardless of color, suspended solids, colloids, oxidizing or reducing agents.

The electrode system consists of a sturdy glass electrode which may be inserted into semi-solids and a saturated calomel electrode.

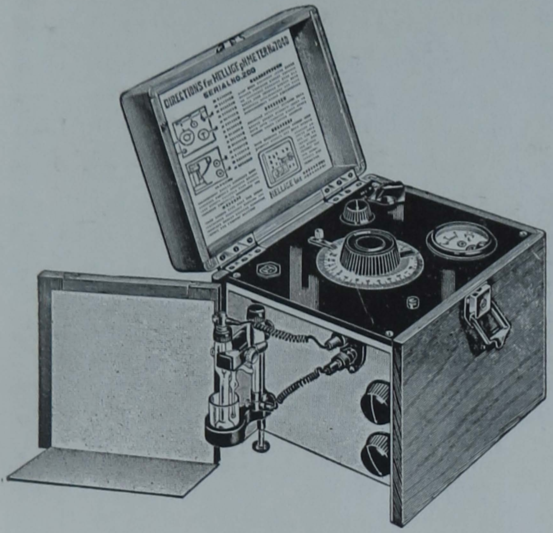
pH is read by pressing a button in the center of potentiometer knob and turning the knob until the meter indicates that the balance point has been reached.

The instrument is entirely self-contained with batteries inside the case and is calibrated in pH units over the range 0 to 13 with readings to 0.01 pH unit. Oxidation-reduction potentials can also be measured directly in millivolts. Dimensions: length, 11 inches; depth, 8 inches; height, 9 inches. Weight, 17½ pounds. Complete for pH and EMF measurements with one each glass, calomel and platinum electrodes, accessories and full directions. **Each**..............$195.00

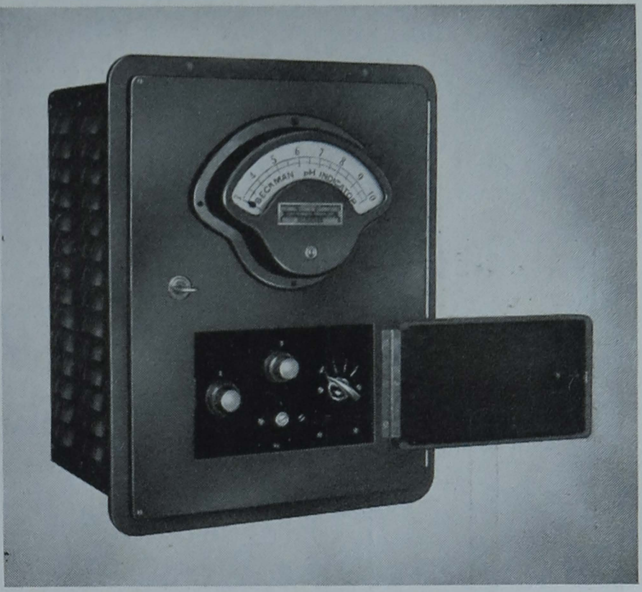
Replacement Parts for 218M23

218M24 Glass Electrode. 2½-inch; sealed. **Each**.....$6.00
218M25 Calomel Electrode. 2½-inch; sealed. **Each**...$6.50
218M26 Sleeve. For 218M25. **Each**..................$1.00
218M27 Platinum Electrode. 2½-inch; sealed. **Each**..$2.50
218M28 Beaker. For 5 ml. sample. **Each**............$ .15
218M29 Electronic Tube, No. 32. **Each**.............$1.75
218M30 Electronic Tube, No. 30. **Each**.............$ .75
218M31 Glass Electrode. 5-inch; shielded. With 30-inch cable. **Each**..$7.50
218M32 Extra Cable. For 218M31. **Foot**............$ .20
218M33 Calomel Electrode. 5-inch. With 30-inch lead. **Each**..$7.50
218M34 Extra Lead. For 218M33. **Foot**.............$ .05
218M35 Glass Sleeve. For 218M33. **Each**...........$1.50
218M36 Platinum Electrode. 5-inch; sealed. With 30-inch lead. **Each**..$3.50
218M37 Electrode Holder. **Each**...................$1.50
218M38 Sealed One-Drop Glass Electrode. **Each**.....$7.50
218M39 Holder. For 218M38. **Each**.................$ .50
218M40 Sealed Flow-Type Electrode Assembly. Consists of one each glass and calomel electrode. **Each**.........$13.00
218M41 Glass Electrode, Only. For 218M40. **Each**...$8.00
218M42 Calomel Electrode, Only. For 218M40. **Each** $5.00
218M43 Micro Glass Electrode Assembly. Unsealed. Furnished with inner electrode, 5 grams of Quinhydrone, 50 ml. KC1 solution, 50 ml. 0.1 N HCl and spare micro tubes. **Each**..$7.80
218M44 Beaker and Adapter. For 0.5 ml. sample. **Each**..$1.50
218M45 Thermometer. Range, 0° to 50° C. **Each**....$2.50
218M46 Support Stand. For 218M37. **Each**.........$1.00
218M47 Complete Set of Batteries. **Set**.............$3.55

Hydrogen-Ion (pH) Apparatus, Continued



219M1



219M5

219M1 pH Meters, Hellige. For making accurate pH determinations with all types of electrode systems. The instrument is self-contained with batteries inside the case and consists essentially of a potentiometer reading directly in pH combined with a vacuum tube circuit for indicating the null point. The entire instrument and electrode compartment are electrically shielded. The electrode clamp can be removed and placed on a support stand for electrometric titrations.

The potentiometer is arranged so that pH values can be read directly from the dial, which is mounted in such a way that it can be adjusted to conform to any electrode system and then locked into position with a clamp. The dial scale covers the full range of 0 to 14 pH and is divided into 0.1 pH unit and readings are accurately estimated to 0.05 pH units. The working current of the potentiometer is adjusted by a single control which automatically provides for temperature compensation between the range of 10 to 40° C.

The null indicator consists of two vacuum tubes of standard type arranged in a stable circuit and adjustment is provided by fine and coarse controls mounted in the electrode compartment. The amplifier requires no precise setting as it is responsive over the full scale of the meter.

The electrode system as furnished consists of glass and calomel electrodes, but any electrode system under any desired method of hookup can be employed with the instrument being operated in the same way in all cases.

When the potentiometer knob is turned to zero the instrument can then be used as a separate "null indicator" or vacuum tube galvanometer.

The case is polished walnut, 9¼x7¼x8½ inches. Weight, 13¼ pounds. Complete with glass and calomel electrodes, accessories and full directions. **Each** **$150.00**

219M2 Glass Electrode. Complete with Bakelite screw cap and platinum electrode. **Each** **$4.75**

219M3 Calomel Electrode. Filled and ready for use. **Each** **$7.50**

219M4 Batteries. Complete set **$2.20**

219M5 pH Meters, Automatic Model R, Beckman. For continuous pH measurements. Incorporates a potentiometric circuit automatically maintained in null balance by an electronic amplifier. Operates on A. C. 110-125 volts with self-contained voltage regulator. Can be connected to a Tag Potentiometer Recorder-Controller to record and control pH of solutions in processes.

The electrode system consists of a shielded glass electrode and saturated calomel electrode. Temperature compensation is automatic. pH is read directly on a 6-inch scale with accuracy of 0.1 pH.

Electrodes may be installed directly in flow lines and tanks. Terminals are provided for connection to recorder, controller and remote indicating meters.

Case is black-enameled cast aluminum. Dimensions: 16½x13x12 inches. Shipping weight, 75 pounds.

Complete with electrodes, accessories and full directions.

pH range	0 to 7	3 to 10	6 to 13
Each	**$450.00**	**450.00**	**450.00**

219M6 Electrode Assembly, Flow Type. For installation directly in pipe lines. For use with 218M1 for continuous pH indication and with 219M5 for continuous pH indication and automatic recording and control. Consists of an internally shielded glass electrode and permanently charged Calomel electrode mounted in an acid-resisting, porcelain enameled flow chamber with stainless steel cover plate having provision for thermometer insertion. Flow chamber has 1-inch inlet and ¾-inch outlet, I. P. S. connections. Regularly supplied with 10-foot length of shielded lead but longer leads are available up to 500 feet. **Each** **$55.50**

219M7 Electrode Assembly, Immersion Type. Similar to 219M6, except electrodes are mounted for immersion to any depth in vats or tanks by ¾-inch I. P. S. connections. **Each** **$42.00**

Note: A wide variety of electrodes, flow chambers, and other accessories are available for different applications. Information and prices on request.

Hydrometers, A. P. I.

220M1 Hydrometers, Tag, A. P. I., Plain Form. Approximate length, 13 inches, except type 32000, which is approximately 14 inches.

Type	32000	32003	32006	32009	32012	32015	32018
Range, degrees	10 to 100	10 to 45	45 to 90	10 to 30	20 to 40	30 to 50	40 to 60
Graduations, degrees	1	½	½	⅕	⅕	⅕	⅕
Each	$2.25	2.25	2.25	2.25	2.25	2.25	2.25

Type, continued	32021	32024	32027	32030	32031	32033	32036
Range, degrees	50 to 70	60 to 80	70 to 90	80 to 100	0 to 11	10 to 21	19 to 31
Graduations, degrees	⅕	⅕	⅕	⅕	⅒	⅒	⅒
Each	$2.25	2.25	2.25	2.25	2.25	2.25	2.25

Type, continued	32039	32042	32045	32048	32051	32054	32055
Range, degrees	29 to 41	39 to 51	49 to 61	59 to 71	69 to 81	79 to 91	89 to 101
Graduations, degrees	⅒	⅒	⅒	⅒	⅒	⅒	⅒
Each	$2.25	2.25	2.25	2.25	2.25	2.25	2.25

220M2 Hydrometers, Tag, A. P. I., Combined Form. With thermometer at bottom. Thermometer graduated 20 to 130° F. in 2° divisions. Approximate length, 14¾ inches.

Type	32058	32060	32063	32066	32069	32072	32075
Range, degrees	30 to 90	10 to 45	45 to 90	10 to 30	20 to 40	30 to 50	40 to 60
Graduations, degrees	½	½	½	⅕	⅕	⅕	⅕
Each	$4.00	4.00	4.00	4.00	4.00	4.00	4.00

Type, continued	32078	32081	32084	32087	32088	32118*	32090
Range, degrees	50 to 70	60 to 80	70 to 90	80 to 100	0 to 11	0 to 11	10 to 21
Graduations, degrees	⅕	⅕	⅕	⅕	⅒	⅒	⅒
Each	$4.00	4.00	4.00	4.00	4.00	4.00	4.00

Type, continued	32119*	32093	32121*	32096	32099	32102	32105
Range, degrees	10 to 21	19 to 31	19 to 31	29 to 41	39 to 51	49 to 61	59 to 71
Graduations, degrees	⅒	⅒	⅒	⅒	⅒	⅒	⅒
Each	$4.00	4.00	4.00	4.00	4.00	4.00	4.00

Type, continued	32108	32111	32112	32113	32115	32116
Range, degrees	69 to 81	79 to 91	89 to 101	22 to 30	29 to 37	36 to 44
Graduations, degrees	⅒	⅒	⅒	⅒	⅒	⅒
Each	$4.00	4.00	4.00	4.00	4.00	4.00

*Furnished with thermometer range 60 to 220° F.

220M3 Hydrometers, Tag, A. P. I., Combined Form. With thermometer at top. Thermometer graduated 20 to 130° F. in 2° divisions. Approximate length, 15 inches.

Type	32114	32117	32120	32123
Range, degrees	10 to 45	10 to 30	20 to 40	30 to 50
Graduations, degrees	½	⅕	⅕	⅕
Each	$4.79	4.79	4.79	4.79

Type, continued	32124*	32126*	32129*	32132
Range, degrees	0 to 11	10 to 21	19 to 31	29 to 41
Graduations, degrees	⅒	⅒	⅒	⅒
Each	$4.79	4.79	4.79	4.79

*Can be furnished with thermometer range 60 to 220° F. when specified.

220M4 Hydrometers, Tag, A. P. I., 4-Ounce, Plain Form. Approximate length, 6¼ inches.

Type	32135	32138	32141	32144	32147	32150	32153
Range, degrees	10 to 45	45 to 90	10 to 30	20 to 40	30 to 50	40 to 60	50 to 70
Graduations, degrees	1	1	½	½	½	½	½
Each	$2.25	2.25	2.25	2.25	2.25	2.25	2.25

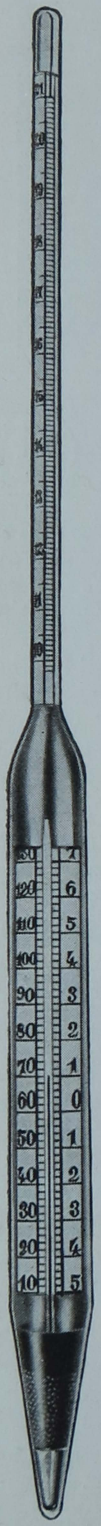
Type, continued	32156	32159	32162	32165	32168	32171	32174
Range, degrees	60 to 80	70 to 90	80 to 100	10 to 21	19 to 31	29 to 41	39 to 51
Graduations, degrees	½	½	½	⅕	⅕	⅕	⅕
Each	$2.25	2.25	2.25	2.25	2.25	2.25	2.25

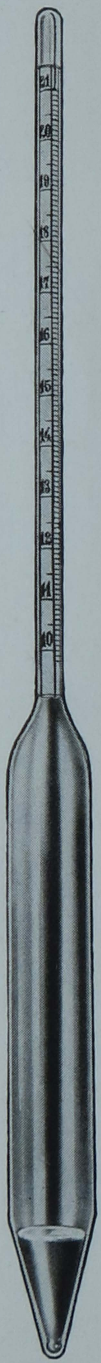
Type, continued	32177	32180	32183	32186	32187	32189	32192
Range, degrees	49 to 61	59 to 71	69 to 81	79 to 91	89 to 101	10 to 16	15 to 21
Graduations, degrees	⅕	⅕	⅕	⅕	⅕	⅒	⅒
Each	$2.25	2.25	2.25	2.25	2.25	2.25	2.25

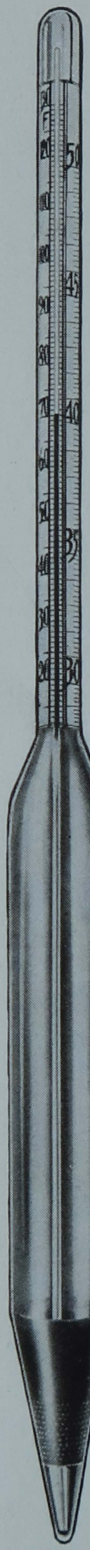
Type, continued	32195	32198	32201	32204	32207	32210	32213
Range, degrees	20 to 26	25 to 31	30 to 36	35 to 41	40 to 46	45 to 51	50 to 56
Graduations, degrees	⅒	⅒	⅒	⅒	⅒	⅒	⅒
Each	$2.25	2.25	2.25	2.25	2.25	2.25	2.25

Type, continued	32216	32219	32222	32225	32228	32231	32234
Range, degrees	55 to 61	60 to 66	65 to 71	70 to 76	75 to 81	80 to 86	85 to 91
Graduations, degrees	⅒	⅒	⅒	⅒	⅒	⅒	⅒
Each	$2.25	2.25	2.25	2.25	2.25	2.25	2.25

Note: Thermometers Nos. 32165 to 32187, inclusive, can be furnished with an approximate length of 4 inches when so specified.


220M2


220M1


220M3

Hydrometers, Continued

221M1 Hydrometers, Tag, A. P. I., 4-Ounce, Combined Form. With thermometer at bottom. Thermometer graduated 20 to 130° F. in 2° divisions. Approximate length, 7 inches.

Type	**32237**	**32240**	**32243**	**32246**	**32249**	**32252**	**32255**
Range, degrees	10 to 45	45 to 90	10 to 30	20 to 40	30 to 50	40 to 60	50 to 70
Graduations, degrees	1	1	½	½	½	½	½
Each	**$4.00**	**4.00**	**4.00**	**4.00**	**4.00**	**4.00**	**4.00**

Type, continued	**32258**	**32261**	**32264**	**32267**	**32270**	**32273**	**32276**
Range, degrees	60 to 80	70 to 90	80 to 100	10 to 21	19 to 31	29 to 41	39 to 51
Graduations, degrees	½	½	½	⅕	⅕	⅕	⅕
Each	**$4.00**	**4.00**	**4.00**	**4.00**	**4.00**	**4.00**	**4.00**

Type, continued	**32279**	**32282**	**32285**	**32288**	**32289**	**32291**	**32294**
Range, degrees	49 to 61	59 to 71	69 to 81	79 to 91	89 to 101	10 to 16	15 to 21
Graduations, degrees	⅕	⅕	⅕	⅕	⅕	⅒	⅒
Each	**$4.00**	**4.00**	**4.00**	**4.00**	**4.00**	**4.00**	**4.00**

Type, continued	**32297**	**32300**	**32303**	**32306**	**32309**	**32312**	**32315**
Range, degrees	20 to 26	25 to 31	30 to 36	35 to 41	40 to 46	45 to 51	50 to 56
Graduations, degrees	⅒	⅒	⅒	⅒	⅒	⅒	⅒
Each	**$4.00**	**4.00**	**4.00**	**4.00**	**4.00**	**4.00**	**4.00**

Type, continued	**32318**	**32321**	**32324**	**32327**	**32330**	**32333**	**32336**
Range, degrees	55 to 61	60 to 66	65 to 71	70 to 76	75 to 81	80 to 86	85 to 91
Graduations, degrees	⅒	⅒	⅒	⅒	⅒	⅒	⅒
Each	**$4.00**	**4.00**	**4.00**	**4.00**	**4.00**	**4.00**	**4.00**

221M2 Hydrometers, Tag, A. P. I., 4-Ounce, Combined Form. With thermometer at top. Thermometer graduated 20 to 130° F. in 2° divisions. Approximate length, 7½ inches.

Type	**32339**	**32342**	**32345**	**32348**
Range, degrees	10 to 45	10 to 30	20 to 40	30 to 50
Graduations, degrees	1	½	½	½
Each	**$4.79**	**4.79**	**4.79**	**4.79**

Hydrometers, Tag, A. P. I., Certified. Supplied in both plain and combined form. Compared with U. S. Standard Instrument and furnished with certificate of accuracy of points indicated. Guaranteed accuracy higher than that required by the A. S. T. M. or U. S. Government. Features include:

Red Indicator. A strip of red glass fused to stem indicates position of hydrometer scale. An A. S. T. M. requirement.

Double Gravity Scale. Permits readings from any position when hydrometer rotates. Fastened with a cement that withstands 300° F. Scale cannot slip.

Yellow Colored Scale. With black figures designed for easy reading. Color combination ideal for contrast.
Red Stripe Tube. Large bore lens-front thermometer tube with red stripe above mercury—facilitates reading.

Metal Thermometer Scale. 25% longer than paper scale. Firmly imbedded in ballast. Cannot slip. Open graduations permit accurate readings.

Solid Metal Ballast. No mercury to spill in plain form. No shot to escape in combined form. Metal ballast withstanding 300° F. is kept in place by enlargements on thermometer stem.

Stream-line Tip. Easy to clean. Sinks quickly in heavy oils. Permits use of extremely sensitive thermometer bulb.

221M3 Hydrometers, Tag, A. P. I., Certified, Plain Form. Approximate length, 15 inches.

Type	**C32031**	**C32033**	**C32036**	**C32039**	**C32042**	**C32045**	**C32048**	**C32051**	**C32054**
Range, degrees	0 to 10	10 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90
Graduations, degrees	⅒	⅒	⅒	⅒	⅒	⅒	⅒	⅒	⅒
Each	**$3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**

221M4 Hydrometers, Tag, A. P. I., Certified, Combined Form. With thermometer at bottom. Thermometer graduated 20 to 130° F. in 2° divisions. Approximate length, 15 inches.

Type	**C32088***	**C32090***	**C32093**	**C32096**	**C32099**	**C32102**	**C32105**	**C32108**	**C32111**
Range, degrees	0 to 10	10 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90
Graduations, degrees	⅒	⅒	⅒	⅒	⅒	⅒	⅒	⅒	⅒
Each	**$5.00**	**5.00**	**5.00**	**5.00**	**5.00**	**5.00**	**5.00**	**5.00**	**5.00**

*Furnished with thermometer range 60° to 220° F. when specified.

221M5 Hydrometers, Mudwate, Braun. Provides an efficient, accurate and direct reading means of obtaining the specific gravity or weight per unit volume of cement and rotary mud in oil drilling operations. With two engraved scales, one reading in pounds per gallon; and the other, in pounds per cubic foot. Shipping weight, 10 pounds. Complete with metal cylinder.

Each	**$20.00**

221M6 Hydrometers, Mudwate, Braun. Same as 221M5, except with additional scale reading in specific gravity.

Each	**$25.00**

Hydrometers, Continued

222M1 Hydrometers, Precision Grade, Baume, Heavy Liquids. For general use. Approximate length, 12 inches. Temperature, 60° F.

Range, degrees	**0 to 50**	**0 to 70**	**0 to 35**	**35 to 70**
Graduations, degrees	1	1	½	½
Each	**$2.25**	**2.25**	**2.25**	**2.25**

222M2 Hydrometers, Commercial Grade, Baume, Heavy Liquids. Approximate length, 12 inches. Temperature, 60° F.

Range, degrees	**0 to 50**	**0 to 70**
Graduations, degrees	1	1
Each	**$ .50**	**.50**

222M3 Hydrometers, Precision Grade, Baume, Light Liquids. Approximate length, 12 inches. Temperature, 60° F. Range, 10° to 100°. Graduations, 1°. **Each**........**$2.25**

222M4 Hydrometers, Commercial Grade, Baume, Light Liquids. Approximate length, 12 inches. Temperature, 60° F. Range 10° to 100°. Graduations, 1°. **Each**........**$ .50**

222M5 Hydrometers, Precision Grade, Specific Gravity, Heavy Liquids. Approximate length, 12 inches. Temperature, 60° F. Range, 1.000 to 2.000. Graduations, .010. **Each**........**$2.25**

222M6 Hydrometers, Commercial Grade, Specific Gravity, Heavy Liquids. Approximate length, 12 inches. except range 1.000-2.000 which is 11 inches long.

Range, sp. gr.	1.000-1.200	1.200-1.400	1.400-1.600	1.600-1.800	1.800-2.000	1.000-2.000
Each	**$1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**

222M7 Hydrometers, Precision Grade, Specific Gravity, Light Liquids. Approximate length, 12 inches. Temperature, 60° F. Range, 0.650 to 1.000. Graduations, .005. **Each**........**$2.25**

222M8 Hydrometers, Commercial Grade, Specific Gravity, Light Liquids. Approximate length, 11 inches. Temperature, 60° F. Range .700 to 1.000. Graduations, .005. **Each**........**$. 95**

222M9 Hydrometers, Commercial Grade, Combination Scale, Heavy Liquids. Approximate length 11 inches. Temperature, 60° F.

Baume, 0 to 70° in graduations of 1° and specific gravity, 1.000 to 1.900 in graduations of .01.

Each........**$ .95**

222M10 Hydrometers, Commercial Grade, Combination Scale, Light Liquids. Approximate length, 11 inches. Temperature, 60° F.

Baume, 10° to 100° in graduations of 1° and specific gravity, 0.600 to 1.000 in graduations of .005.

Each........**$ .95**

222M11 Hydrometers, Commercial Grade, Combination Scale, Light and Heavy Liquids. Approximate length, 16 and 11 inches, respectively. Temperature, 60° F.

Light Liquids { Baume, 10° to 100° in graduations of 1°.
Specific gravity, .600 to 1.000 in graduations of .005.
and
Heavy Liquids { Baume, 0° to 70° in graduations of 1°.
Specific gravity, 1.000 to 2.000 in graduations of .01.

Each........**$1.50**

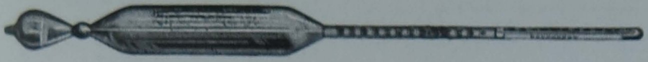
222M12 Hydrometers, Commercial Grade, Calcium Chloride. For calcium chloride brine. Approximate length, 11 inches. Temperature, 60° F. Range, 0 to 120°. Graduations, 1°. **Each**........**$1.00**

222M13 Hydrometers, Commercial Grade, Salometer. For salt brine. Approximate length, 11 inches. Temperature, 60° F. Range, 0 to 100°. Graduations, 1°. **Each**........**$1.00**

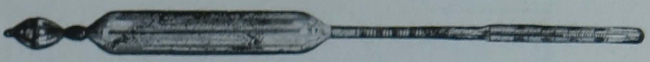
0
10
20
30
40
50

222M1

Hydrometers, Continued



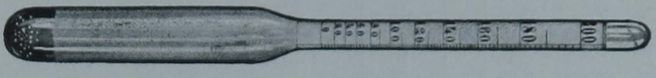
223M1



223M2

223M1 Hydrometers, Milk, Plain Form. Specification of the U. S. Department of Agriculture. Quevenne scale, 24 to 37° by 1/10° (specific gravity 1.024 to 1.037 by 0.0001). Approximate length, 12 inches. **Each**.......... **$3.75**

223M2 Hydrometers, Milk, Lactodensimeter. With thermometer in stem. Quevenne scale, 14 to 42° by 1° (specific gravity 1.014 to 1.042 by 0.001). Approximate length, 13 inches. **Each**.......... **$4.79**

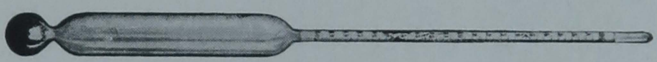


223M4

223M3 Hydrometers, Spirit, Combination Scale. Approximate length, 11 inches.
Range: Proof, 100 below to 100 above, in graduations of 2%; and Tralle, 0 to 100%, in graduations of 1%. **Each**....... **$1.25**

223M4 Hydrometers, Spirit. Per cent of proof, U. S. Department of Internal Revenue. Approximate length, 8¾ inches.

Range, per cent of proof	**0 to 100**	**80 to 120**	**100 to 140**	**130 to 170**	**160 to 200**
Graduations, degrees	1	½	½	½	½
Each	**$2.75**	**2.75**	**2.75**	**2.75**	**2.75**



223M5

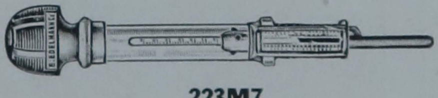
223M5 Hydrometers, Sugar, Brix Scale, Laboratory Grade. Scale length, approximately 4½ inches. Graduated in 0.1° divisions. Accurate to less than 0.1° Brix. Standardized at 20° C. Approximate length, 12 inches.

Range, degrees	0 to 6	0 to 10	3 to 9	6 to 12	9 to 15	12 to 18	18 to 24	24 to 30	30 to 36
Each	**$1.50**	**1.50**	**1.50**	**1.50**	**1.50**	**1.50**	**1.50**	**1.50**	**1.50**

Range, degrees, continued	35 to 70	36 to 42	42 to 48	48 to 54	54 to 60	60 to 66	66 to 72	72 to 78
Each	**$1.50**	**1.50**	**1.50**	**1.50**	**1.50**	**1.50**	**1.50**	**1.50**

223M6 Hydrometers, Sugar, Brix Scale, Mill Grade. Accurate to 0.1° Brix.

Range, Degrees	**0 to 5**	**0 to 10**	**0 to 8**	**6 to 20**	**20 to 50**	**40 to 70**	**60 to 90**
Graduations, degrees	0.2	0.2	0.2	0.2	0.5	0.5	0.5
Length, total, inches	6	6	6	12	12	12	12
Length, scale, inches	2	2	3	5	5	5	5
Calibrated at degrees C.	85	85	20	20	20	20	20
Each	**$1.20**	**1.20**	**1.20**	**.95**	**.95**	**.95**	**.95**



223M7

223M7 Hydrometers, Battery, "Break-Not." With thermometer. Octagon tip and red rubber bulb protect it from breakage. Glass parts never come in direct contact with hard floors or work benches. Thermometer in is a separate barrel. Dirty or cloudy battery acid whirls up into the hydrometer barrel without touching the thermometer scale and obstructing visibility.

Each.......... **$1.25**

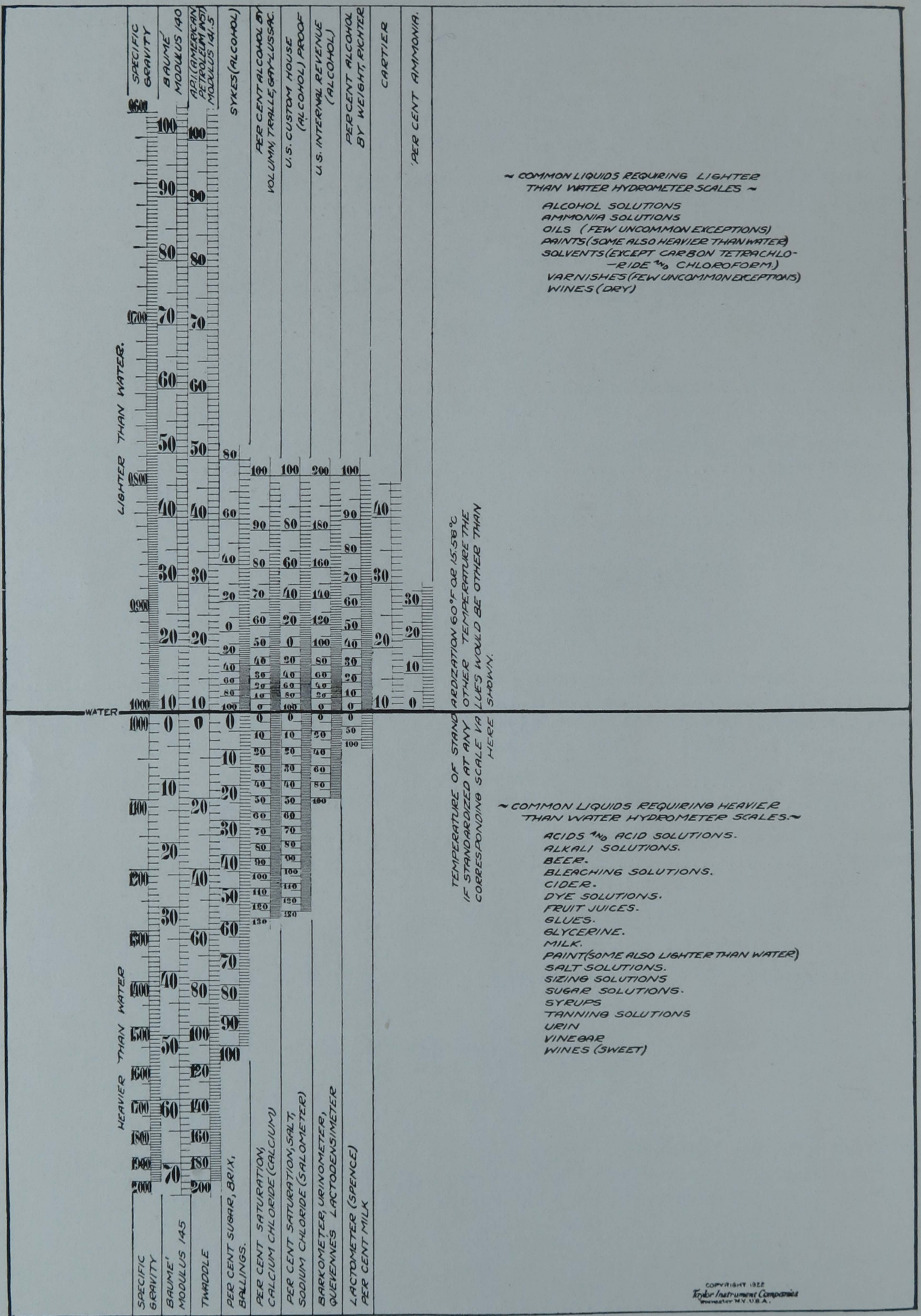
223M8 Rubber Bulb. Each.......... **$ .35**

223M9 Glass Jar. Each.......... **$ .35**

223M10 Hydrometer Tip with Thermometer. Each.......... **$ .50**

223M11 Hydrometer Float. Each.......... **$ .35**

Hydrometer Scales



~ COMMON LIQUIDS REQUIRING LIGHTER THAN WATER HYDROMETER SCALES ~

ALCOHOL SOLUTIONS
AMMONIA SOLUTIONS
OILS (FEW UNCOMMON EXCEPTIONS)
PAINTS (SOME ALSO HEAVIER THAN WATER)
SOLVENTS (EXCEPT CARBON TETRACHLORIDE AND CHLOROFORM.)
VARNISHES (FEW UNCOMMON EXCEPTIONS)
WINES (DRY)

TEMPERATURE OF STANDARDIZATION 60°F OR 15.56°C IF STANDARDIZED AT ANY OTHER TEMPERATURE THE CORRESPONDING SCALE VALUES WOULD BE OTHER THAN HERE SHOWN.

~ COMMON LIQUIDS REQUIRING HEAVIER THAN WATER HYDROMETER SCALES. ~

ACIDS AND ACID SOLUTIONS.
ALKALI SOLUTIONS.
BEER.
BLEACHING SOLUTIONS.
CIDER.
DYE SOLUTIONS.
FRUIT JUICES.
GLUES.
GLYCERINE.
MILK.
PAINT (SOME ALSO LIGHTER THAN WATER)
SALT SOLUTIONS.
SIZING SOLUTIONS
SUGAR SOLUTIONS.
SYRUPS
TANNING SOLUTIONS
URIN
VINEGAR
WINES (SWEET)

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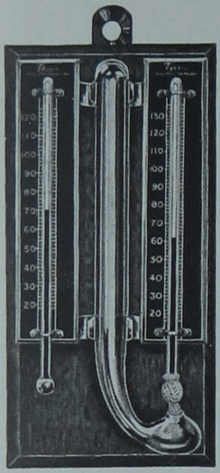
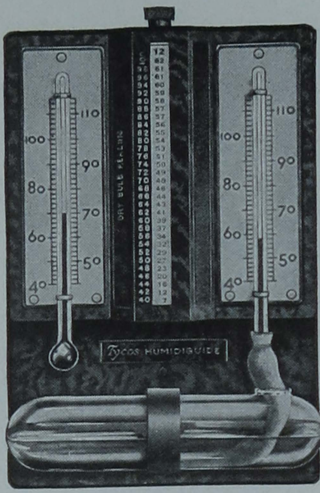
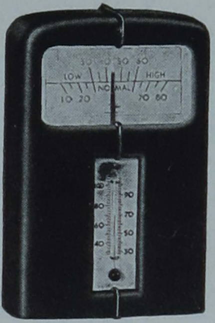
Hygrometers



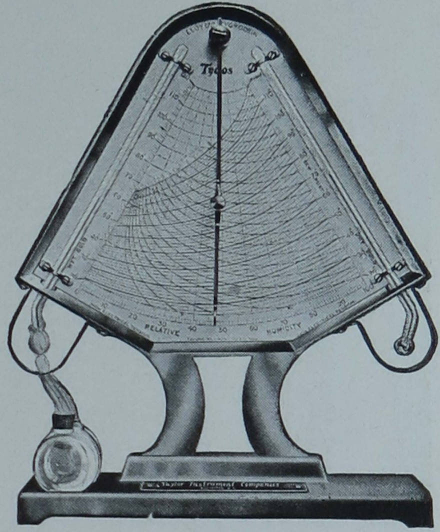
225M1



225M7



225M9



225M10

225M1 Hygrometers, Mason's Form. Consists of a wet-bulb and a dry-bulb thermometer, suitably mounted and provided with a reservoir to supply water to the wet bulb. Tubes are mercury-filled with magnifying lens, approximate range, 30° to 120° F. Scales are black oxidized finished with white figures and graduations mounted on mahogany panel, 8½x4½ inches with insulating supports. Complete, with spare wicks and chart. **Each** **$5.00**

225M2 Hygrometers, Mason's Form. Same as 225M1, except with red permacolor (non-fading and easy-reading) tubes. **Each** **$5.00**

225M3 Hygrometers, Mason's Form. High range. Tubes are mercury-filled with magnifying lens, range approximately 60° to 220° F. Scales are black oxidized finished with white figures and graduations, mounted on bronze lacquered brass panel, 8½x4½ inches with insulating supports and syphon reservoir. Complete, with spare wicks and chart, in a box. **Each** **$6.00**

225M4 Extra Wet or Dry Thermometer and Scale. For 225M1. **Each** **$1.75**

225M5 Extra Wet or Dry Thermometer and Scale. For 225M2. **Each** **$1.75**

225M6 Extra Wet or Dry Thermometer and Scale. For 225M3. **Each** **$2.00**

225M7 Humiguides, Mason's Form. Permacolor tubes with magnifying lens, indoor temperature range. Scales have burnished metal figures and graduations on a polished lacquer background. Frame is mahogany Bakelite 6x4x1½ inches with revolving humidity table and easy filling reservoir. Complete, with spare wicks and instructions, in attractive box. **Each** **$5.00**

225M8 Extra Wet or Dry Thermometer and Scale. For 225M7. **Each** .... **$ .90**

225M9 Humiguides, Hampton. Gives both relative humidity and air temperature at a glance. Attractive dial with an indoor thermometer to match. Of modern design with handsomely trimmed case, 6x4x1¾ inches. **Each** **$3.50**

225M10 Hygrometers, Hygrodeiks. For determining the amount of moisture in the atmosphere. Consists of a wet-bulb and a dry-bulb thermometer mounted on a chart from which the humidity conditions can be determined without reference to tables. The scale on the left side of the chart corresponds to the wet-bulb temperature. The scale on the right corresponds to the dry-bulb temperature, and from it curved lines extend downward to the left.

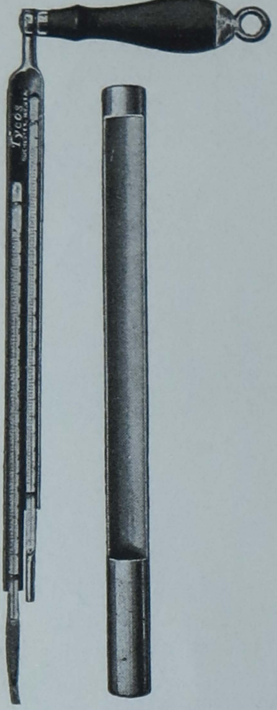
Swing the index hand to the scale on the left and set the sliding pointer at the wet-bulb temperature. Then swing the index hand to the right until the pointer intersects the curved line extending downward to the left, corresponding to the dry-bulb temperature. By following the curved line nearest the pointer at the upper left-hand corner of chart, the absolute humidity or grain of moisture per cubic foot of air can be obtained. By following the curved line nearest the pointer downward and on the right side of the chart, the dew point can be obtained. These tables are based upon psychrometric chart at sea level.

Nickel silver-finish dial; gray enameled-brass frame. Size, 10x7¾x3 inches. Engraved, magnifying, mercury-filled thermometer tubes. Glass cistern; wick. Temperature range, 20° to 120° F. Complete in box. Weight per box, approximately 4½ pounds. **Each** **$15.00**

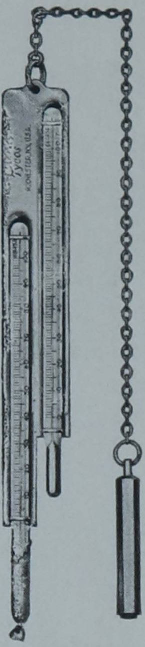
225M11 Extra Water Cistern. Each .... **$ .50**

225M12 Wicks. For 225M1, 225M2, 225M3, 225M7 and 225M10 Hygrometers. **Dozen** .... **$ .90**

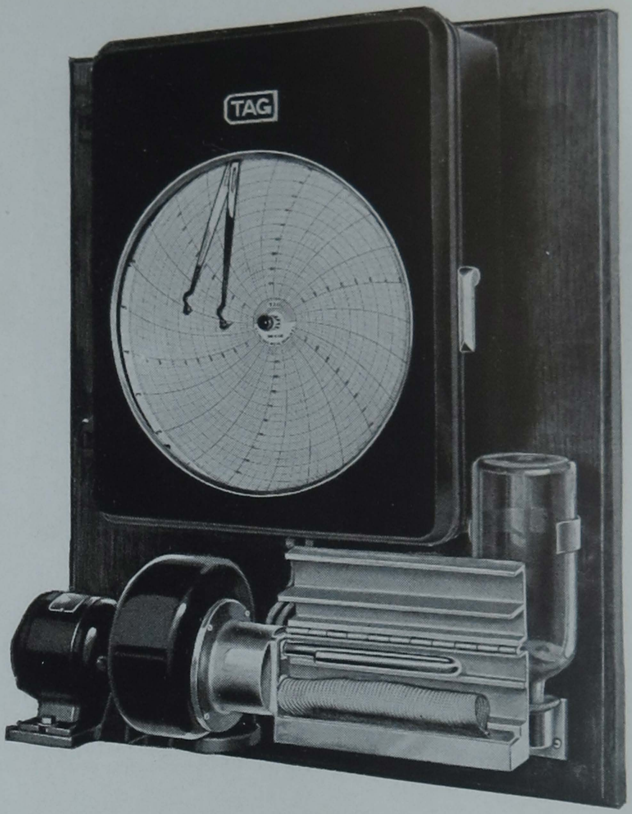
Hygrometers, Continued



226M1



226M5



226M8

226M1 Hygrometers, Sling Psychrometers, Taylor. Two 12-inch etched-stem thermometers are mounted on aluminum back. Temperature range of thermometers is 30° to 200° F. in 1° graduations. Complete with turned wood handle with swivel, spare wicks and chart. In copper case to protect thermometers when not in use. **Each** **$8.63**

226M2 Extra Thermometers. For 226M1. **Each** **$3.00**

226M3 Hygrometers, Sling Psychrometers, Taylor. Same as 226M1, except temperature range of thermometers is 0° to 100° F. in ½° graduations. **Each** **$8.63**

226M4 Extra Thermometers. For 226M3. **Each** **$3.00**

226M5 Hygrometers, Sling Psychrometers, Pocket, Taylor. Two 5-inch etched-stem thermometers are mounted on aluminum back. Temperature range of thermometers is 0° to 100° in 1° graduations. Complete with chain and swivel, with spare wicks and chart. In leather carrying case, 7 inches long. **Each** **$10.13**

226M6 Extra Thermometers. For 226M5. **Each** **$3.00**

226M7 Wicks. For 226M1, 226M3, and 226M5 Hygrometers. **Dozen** .... **$ .90**

226M8 Hygrometers, Recording, Tag. Designed for rooms where there is poor circulation of air. A motor-driven fan provides rapid and uniform circulation across the wet and dry-bulbs assuring accurate psychrometric readings (minimum air velocity for such readings being 15 feet per second).

The wet-bulb and dry-bulb are mounted so that two streams of air are constantly passed over them separately. Thus the dry-bulb is not affected by moisture from wick evaporation.

The instrument has smooth, black-enameled, steel case, mounted on hardwood panel.

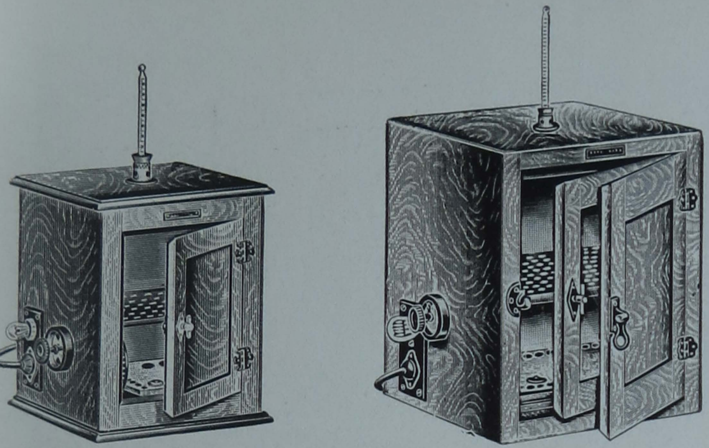
Furnished with 24-hour spring wound clock.

Complete with fan, motor, brass trough, glass bottle, silk wick, 100 charts, two bottles of ink, humidity table and clock. **Each** **$215.00**

226M9 Hygrometers, Recording, Tag. Same as 226M8, except furnished with 24-hour electric motor clock. When ordering specify current characteristics. **Each** **$215.00**

Note: Spring wound or electric motor clocks for 226M8 and 226M9 Recording Hygrometers, with one revolution every 1, 2, 3' 4, 6, 8, 12, 48, or 72 hours, or 7 days, can be supplied. Prices on application.

Incubators



Size 1 Size 2

227M1

227M1 Incubators, Bacteriological. For temperatures of 37½° C. Cabinets are insulated and made of well seasoned five-ply wood and are finished in attractive hand-rubbed light oak finish. Temperature is controlled by an expanding capsule-type thermo-regulator with a visible temperature setting. The thermo-regulator can be adjusted from the outside without opening the door.

Incubator is equipped with heating plates on which are mounted a number of standard electric heating units for uniform distribution of heat within the incubating chamber. Complete with pilot lamp for indicating when the electric current is on or off and Centigrade thermometer. Regularly furnished without stand except that size 3 is equipped with wooden legs 3 inches high. Stands can be furnished for sizes 4 and 5 only, see 227M2 below.

Operate on A. C. or D. C., 110 to 220 volts. When ordering, specify current characteristics.

Size	1	2	3	4	5
Inside dimensions					
Width, inches	9	12	14½	18	20
Depth, inches	9	10½	12½	18	18
Height, inches	12	15	16½	26	30
Shelves, removable, number	1	1	1	2	3
Clearance between shelf and top of door frame, inches	5⅜	7⅛	7½	.....	.....
Clearance between shelves, inches	.....	.....	.....	7⅛	7⅛
Doors, number	1	2	1	2	2
Weight, shipping, pounds	33	60	95	160	180
Each	**$45.00**	**70.00**	**72.50**	**110.00**	**130.00**
227M2 Stands, Only. For 227M1 Floor height, 32 inches. With shelf. **Each**	.....	.....	.....	**20.00**	**20.00**

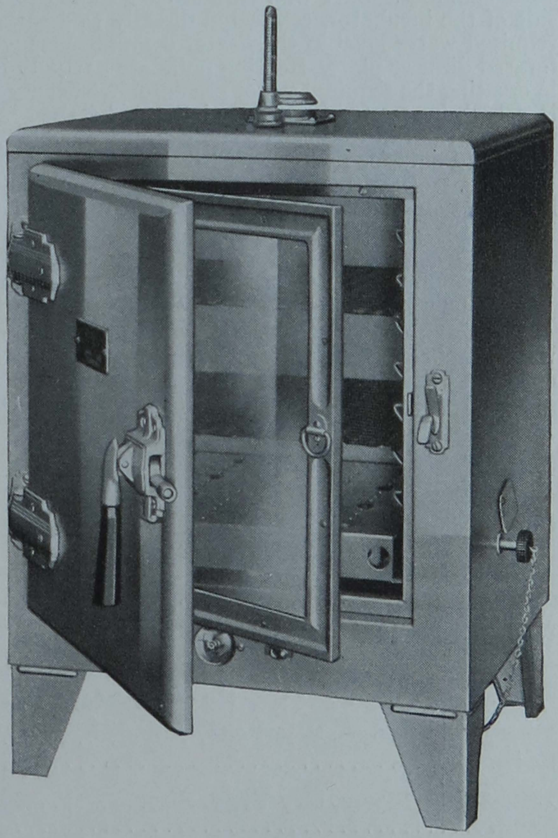
227M3 Incubators, All Metal, Thelco. For automatic temperature control at any point from room temperature to 60° C. Sensitivity, plus or minus ½° C. Inner and outer walls are rust-resisting sheet metal, coated-on exterior with metallic aluminum spray. Outer door has self-closing pressure latch with Bakelite handle. Compressible rubber-cushioned gasket seals the door tightly shut. Between double walls of both cabinet and door is a 2-inch blanket of glass wool which reduces wall heat absorption, insulates against room temperature fluctuations, arrests radiation losses, promotes thermal equilibrium and keeps the outside of the incubator always at a comfortable temperature. The inner glass door permits observation of contents without disturbing thermal conditions. Bimetallic thermostat with silver contact points governs the full heater load without relays or transformers. Thermostat element is located inside the heater compartment. Adjusting knob is easily accessible at side of incubator by means of a removable adjusting key attached to a chain. Nickel chromium coils, wound on asbestos refractories are distributed uniformly over bottom of incubator in a separate compartment covered by a diffuser plate to protect them against drippage. Heaters operate at black heat. Line switch is mounted on front of incubator adjacent to Neon pilot lamp which signals automatic temperature control by the thermostat.

Fresh air enters through the bottom of the incubator, is mixed thoroughly with residual air, then passes into the working chamber. Natural gravity convection currents set up air-flow patterns to insure uniform heat distribution. Air is discharged finally upward along side walls of incubator and through the ports in the top diffuser plate. At the top of the incubator, a 2-inch vent with adjustable shutter permits ventilation control.

Complete with two latticed metal shelves adjustable in height on brackets; Centigrade mercury-in-glass thermometer, range 0-70° C. in 1° divisions, with special markings at 37° C.; thermometer holder; Neon pilot lamp; rubber-covered cord and plug. Regularly furnished with base legs 4 inches high. Stands, 227M4, can be supplied when desired for medium and large sizes.

For single phase, A. C. or D. C., 110 or 220 volts. When ordering, specify current characteristics.

Size	**Small**	**Medium**	**Large**
Width, inches	11	18	35
Depth, inches	11	18	18
Height, inches	11	27	27
Watts	75	150	300
Each	**$70.00**	**110.00**	**185.00**

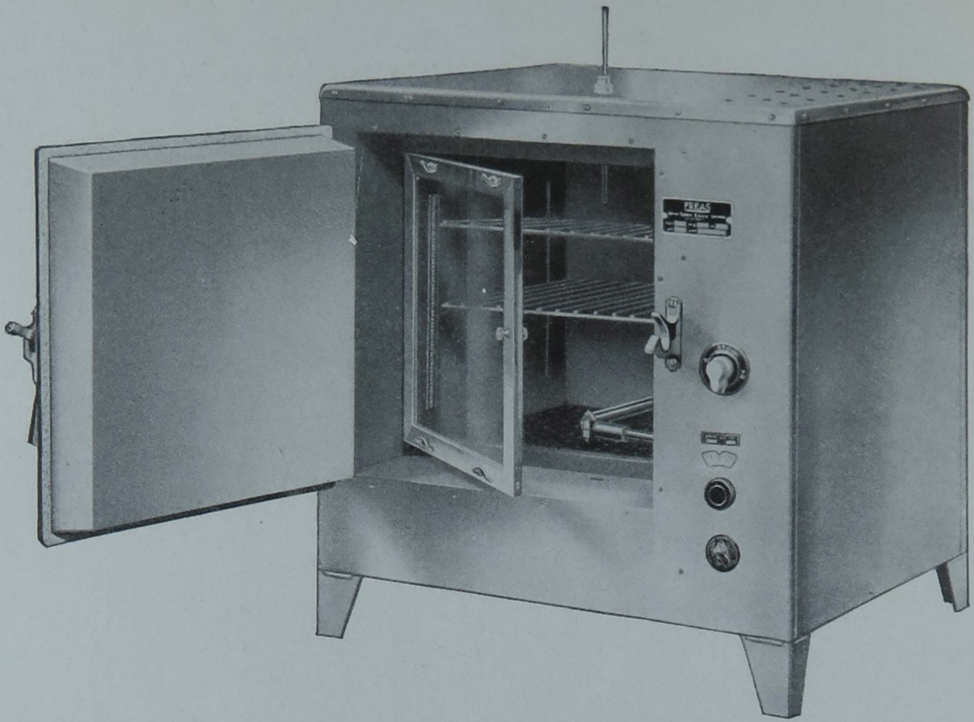


227M3

227M4 Stands, Only. For 227M3. Made of pressed steel, welded construction. Metallic aluminum finish. Height, 38 inches. With shelf 12 inches from the floor.

Size	Medium	Large
Each	**$20.00**	**25.00**

Incubators, Continued



Incubators, Electric, Gravity Convection, Freas

Wet Type. Provides a uniform treatment of culture by maintaining a high water vapor pressure in the working space with the use of the gravity convection principle of heat transfer. Heavy copper interior walls are soldered at all joints constituting a vapor tight chamber. Inner wall surfaces are tinned to resist corrosion and deterioration through use. A constant water level on the side of the incubator, connected directly to a suitable water inlet and drain, produces the necessary moisture and maintains the required water level in the heater compartment which is located below the working chamber and is separated from it by a perforated diffuser plate. Heating units are partially immersed in water at bottom of compartment so as to bring about evaporation in creating the required vapor pressure. Nickel chrome heating elements are of low temperature gradient characteristics, embedded in a high heat refractory material and sheathed in nickel-silver with moisture-proof terminal seal outside the working chamber. Opening the full expanse of the working chamber, an inner glass door, framed in cast-aluminum, gasketed all around its inner edge, and equipped with a positive locking latch, seals the working chamber vapor-tight, and permits full visibility of the incubator contents without breaking the pressure seal or disturbing existing temperature conditions. Size 5 has a double set of both inner and outer doors. A drip shield at the top of the working compartment deflects all condensation to the rear wall, thus eliminating the possibility of condensation dripping on materals placed on the shelf.

Complete with two wire shelves adjustable in height on shelf brackets; 0 to 70° C. mercury-in-glass thermometer with holder; Neon pilot lamp; 6 feet of cord and plug extension; mounted on base legs 4 inches high.

For single phase only, 110 or 220 volts A. C. or D. C., 25, 40, 50 and 60 cycles. When ordering, specify current characteristics.

Dry Type. Same specifications and general construction as the wet type, except not equipped with provisions for creating a water vapor pressure inside the working compartment. Since no moisture is generated inside the working chamber, the walls need not be tinned copper and the interiors are of stainless steel.

Size	**1**	**2**	**3**	**4**	**5**
Inside dimensions					
Width, inches	13	13	19	19	37
Depth, inches	14	25	25	14	25
Height, inches	13	13	19	19	25
Outside dimensions					
Width, inches	25	25	31	31	49
Depth, inches	24	37	37	24	37
Height, inches	28	28	34	34	40
Watts, Wet Type	400	800	800	400	1200
Watts, Dry Type	300	300	600	300	600

Rust-Resistant Iron Exterior, Metallic Aluminum Spray Finish

228M1 Incubators, Wet Type. Size	1	2	3	4	5
Each	**$180.00**	**270.00**	**415.00**	**270.00**	**575.00**

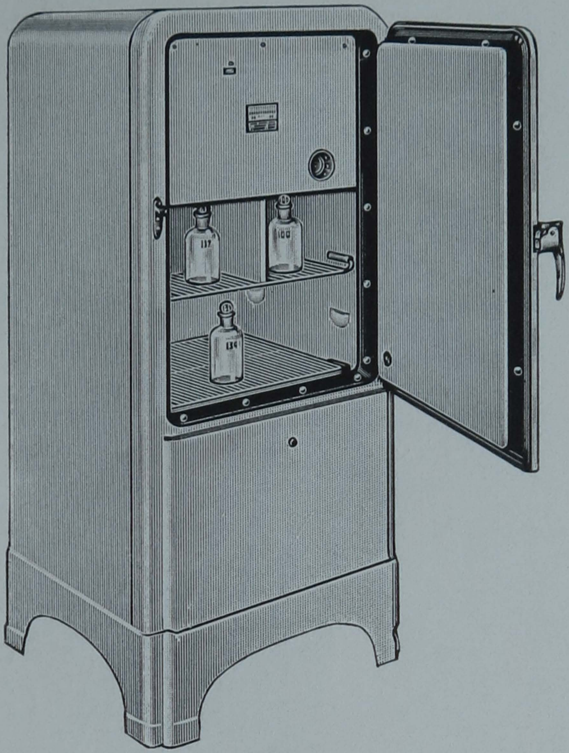
228M2 Incubators, Dry Type. Size	1	2	3	4	5
Each	**$150.00**	**210.00**	**340.00**	**210.00**	**510.00**

Stainless Steel Exterior, Instrument Satin Finish

228M3 Incubators, Wet Type. Size	1	2	3	4	5
Each	**$225.00**	**330.00**	**515.00**	**330.00**	**690.00**

228M4 Incubators, Dry Type. Size	1	2	3	4	5
Each	**$195.00**	**270.00**	**440.00**	**270.00**	**625.00**

Incubators, Continued



229M1

Incubators, Low Temperature. For use in physical, chemical or biological laboratories. Adaptable to such uses as biochemical oxygen demand (B. O. D.) determinations in the treatment control of sewage and industrial waste flow, according to the method adopted by the American Public Health Association, specifying incubation at 20° C.; the preservation of vaccines; serological and complement fixation tests at low temperatures, and enzymatic digestion processes.

Thermostat temperature is adjusted by means of a finger-tip knob and reference dial, and temperature control is automatic at any point from 6° to 30° C. with accuracy plus or minus ¼° C. Thermostat operates on the hydraulic principle, consisting of a liquid expansion coil actuating a snap-action switch which in turn governs operation of the intermittent heater. Switch is sealed into a dust-proof Bakelite housing approved by the U. S. Underwriters' Laboratories, rigidly mounted. Switch contact points are silver, completely protected from dust, dirt, moisture, and require no cleaning or other attention.

Mechanical convection air circulation is produced by a built-in circulating fan and baffles assuring uniform air distribution. Rotary type air-cooled refrigerating compressor has sufficient capacity to maintain cabinet at 6° C. with maximum room temperature of 30° C. Entire compressor mechanism is floated on springs to dampen vibration and noise. The compressor compartment is thoroughly insulated and supplied with special ducts for circulating air, thus keeping the mechanism cool. Compressor is hermetically sealed in one compact unit—the motor directly connected to the compressor—with no belts or pulleys.

A drip pan under the coil collects condensation. Defrosting is not necessary since the operation of the compressor is automatically controlled. The cabinet may be operated continuously.

The cabinet interior is seamless white vitreous enamel; exterior, white Dulux. All metal parts are rust-proofed. The rounded corners of the cabinet and the raised front sill simplify cleaning. It will accommodate 75 standard bottles used for B. O. D. test.

Interior working compartment dimensions: width, 24 inches; depth, 15½ inches; height, 20 inches. Storage shelves are two in number, each 23 inches wide, 15 inches deep. Overall dimensions: width, 30 inches; depth, 25 inches; height, 56 inches.

229M1 Incubators. For 110 volts, 60 cycles, A. C. **Each**.......... **$250.00**

229M2 Incubators. For 220 volts, 60 cycles, A. C. **Each**.......... **$260.00**

229M3 Thermometers, Indicating Dial. With flexible armored bulb extension, and 5-inch diameter dial. Temperature range, 0 to 50° C. in 1° C. **Each**.......... **$13.50**

Inquarts

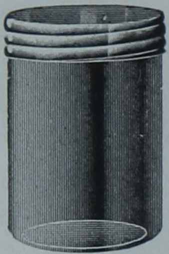
1000
2.04 Mg Pellets
Herman Inquarts

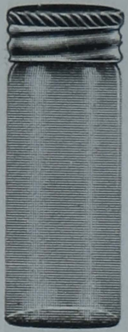
229M4

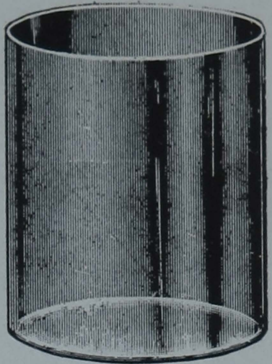
229M4 Inquarts, Herman. For more conveniently inquarting gold assays. These little pellets of lead bullion contain a definite content of silver and may be added directly to the crucible before fusion or tapped into the cleaned lead buttons before cupellation. Uniform in silver content, easy to handle, and free from the objections commonly brought against the conventional methods of inquarting. Supplied in packages of 1,000 pellets with the silver content plainly marked on the package label.

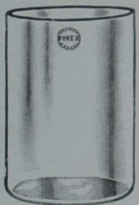
Package of 1,000.......... **$3.00**

Jars


230M1


230M2


230M3


230M4

230M1 Jars, Glass, Screw Cap, Low Form. Inner surface of the jar is straight and smooth without shoulder.

Capacity, ounces	**1**	**2**	**4**
Height, mm.	63	70	85
Diameter, mm.	33	45	52
Dozen	**$1.00**	**1.25**	**1.80**

230M2 Jars, Glass, Screw Cap, High Form.

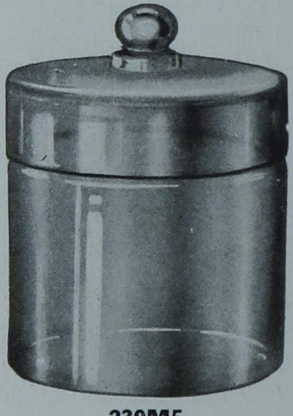
Capacity, ounces	**4**	**8**	**16**
Height, mm.	117	117	146
Diameter, mm.	48	64	79
Dozen	**$ .50**	**.80**	**1.00**

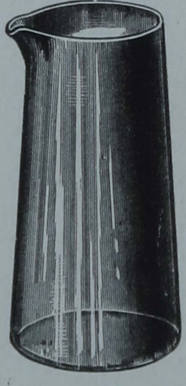
230M3 Jars, Battery, Glass, Round.

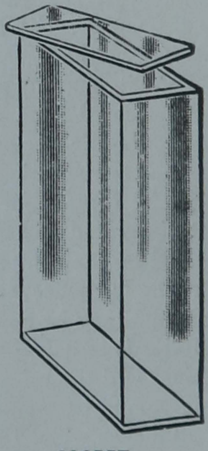
Capacity, ounces	**36**	**74**	**128**	**224**	**448**
Diameter, inches	4	5	6	7	9
Height, inches	5	7	8	9	12
Each	**$ .75**	**1.20**	**1.50**	**2.00**	**3.00**

230M4 Jars, Cylindrical, Pyrex, Plain. Mould blown with substantial walls for mechanical strength. Open ends are ground.

Capacity, gallons	¼	**1**	**1½**	**2¼**	**2½**	**4**	**2⅞**	**5¼**	**5**	**7½**	**10**
Diameter, inches	4	6	6	6	8¾	8¾	10⅛	10⅛	12	12	12
Height, inches	6	6	12	18	10	18	10	18	12	18	24
Quantity in case	12	12	6	5	4	4	1	1	1	1	1
Each	**$ 1.25**	**1.50**	**2.25**	**3.25**	**3.50**	**4.50**	**4.50**	**6.00**	**6.00**	**7.50**	**10.00**
Case	**$13.50**	**16.20**	**12.15**	**14.63**	**12.60**	**16.20**	**4.50**	**6.00**	**6.00**	**7.50**	**10.00**


230M5


230M6


230M7

230M5 Jars, Glass, Storage. Overlapping covers with knob.

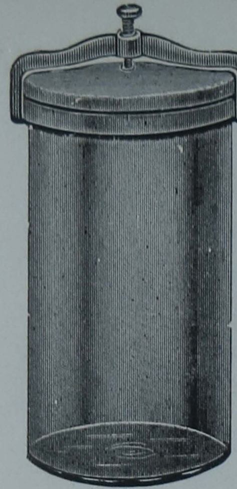
Diameter, inches	**3**	**4**	**5**	**6**	**8**
Height, inches	3	4	5	6	8
Each	**$ .75**	**.90**	**1.15**	**1.75**	**4.50**

230M6 Jars, Precipitating. Conical shape, made of heavy glass with lip for pouring.

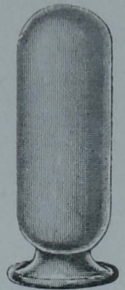
Capacity, pints	1	2	4	8
Each	**$ .80**	**1.10**	**1.50**	**2.00**

230M7 Jars, Museum, Rectangular. Clear white glass of extra fine finish, annealed. The flat ground-on lids have a small vent hole.

Size	**1**	**2**	**3**	**3a**	**4**	**5**	**6**	**7**	**7a**
Height, cm.	5	10	15	15	15	16	20	20	20
Width, cm.	5	4.5	8	10.5	15	10	8	13	15
Depth, cm.	3	3	5	5	9	8	4.5	8	10
Each	**$ .50**	**.55**	**.85**	**1.00**	**1.65**	**1.25**	**1.05**	**1.55**	**1.75**
Size, continued	**8**	**9**	**10**	**11**	**12**	**13**	**13a**	**14**	**14a**
Height, cm.	20	22	25	25	22	25	26	30	30
Width, cm.	13	15	22	25	17.5	25	15	20	25
Depth, cm.	13	5.5	10	12	9	14	8	18	6
Each	**$1.80**	**1.35**	**3.00**	**4.25**	**2.40**	**4.25**	**2.00**	**5.00**	**3.80**



231M1



231M2

231M3

231M5

231M1 Jars, Specimen. Made without contraction at neck so that the width of the neck is the same as the inside diameter of the body. The lid is securely fastened down with metallic clamp and made air tight by a rubber washer.

Size number	**1**	**3**	**6**	**7**	**10**	**11**	**14**
Capacity, pints	½	1	1¾	2½	5½	8	8
Width, mouth inches	2¼	2¼	3½	3½	5	5	6¼
Height, without lid, inches	4	8	6	8	8	12	8
Each	**$1.45**	**1.70**	**2.10**	**2.20**	**4.00**	**4.75**	**6.15**

231M2 Jars, Inverted Show. Fitted with corks.

Capacity, pints	⅛	¼	½	1	2
Dozen	**$2.60**	**3.00**	**3.70**	**4.50**	**7.00**

231M3 Jars, Stoneware. Made of select potter's clay, without lids.

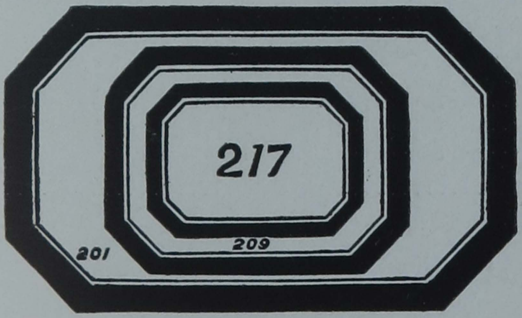
Capacity, gallons	¼	½	**1**	**2**	**3**	**4**	**5**	**6**	**8**	**10**	**15**	**20**	**25**	**30**
Height, inches	5	7	8	10	11	12	13	14	17	17	21	21	24	25
Diameter, inches	4½	6	8	9	10	11	12	12	13	15	16	18	20	20
Each	**$ .15**	**.20**	**.25**	**.50**	**.75**	**1.00**	**1.25**	**1.50**	**2.16**	**2.70**	**4.05**	**5.40**	**6.75**	**8.10**

231M4 Covers, Only.

Each	**$....**	**.17**	**.21**	**.25**	**.35**	**.40**	**.45**	**.50**	**.60**	**.70**	**1.10**	**1.20**	**1.50**	**1.75**

231M5 Jars, Stoneware, Water. With faucet and lid.

Capacity, gallons	**2**	**3**	**4**	**5**	**6**	**8**	**10**	**12**	**15**	**20**	**25**	**30**
Height, inches	10	11	12	13	14	17	17	19	21	21	24	25
Diameter, inches	9	10	11	12	12	13	15	15	16	18	20	20
Each	**$1.75**	**2.00**	**2.30**	**3.05**	**3.30**	**4.35**	**5.00**	**5.60**	**6.60**	**8.65**	**10.80**	**12.35**



231M6

231M6 Labels, Rectangular, Gummed. White paper with red borders.

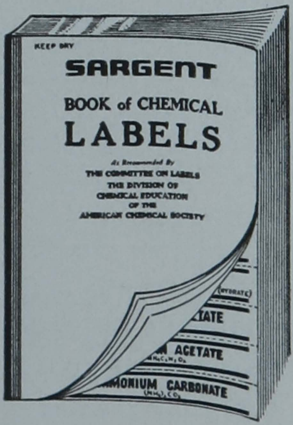
Size, number	**201**	**205**	**209**	**213**	**217**	**223**
Length, mm	64	43	37	30	27	21
Width, mm	40	34	28	24	20	17
Number in box	50	75	100	100	125	150
Box	**$ .10**	**.10**	**.10**	**.10**	**.10**	**.10**

231M7 Labels, Narrow Rectangular, Gummed. White paper with red borders.

Size, number	**259**	**261**
Length, mm	33	51
Width, mm	14	14
Number in box	150	125
Box	**$ .10**	**.10**

231M8 Labels, Narrow Rectangular, Gummed. Same as 231M7, except larger.

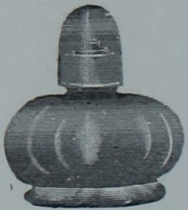
Size number	**2004**	**2007**	**2002**	**2001**	**2005**	**2003**
Length, mm	70	73	95	100	103	120
Width, mm	25	42	25	40	48	50
Number in box	75	75	75	60	40	35
Box	**$ .20**	**.20**	**.20**	**.20**	**.20**	**.20**



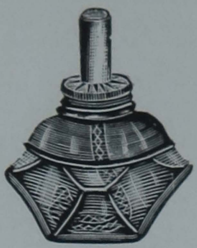
231M9

231M9 Label Books, Chemical Reagent, American Chemical Society. Provides labels for the very common reagents in multiple quantity selected and proportioned in accordance with specifications of the American Chemical Society. The labels bear the names of the chemicals and their formulae. One page of labels of various normalities is included also for use in marking standard solutions. Printed in black on white gummed paper. Each book contains 56 pages, 582 labels, perforated for easy removal and interleaved with permanently bound wax paper to prevent sticking. **Each** .... **$ .75**

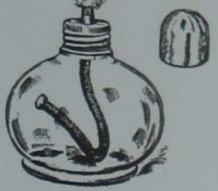
231M10 Label Glaze, Plicote. Clear, unpigmented material which has resistance to chemical attack, moisture and heat. Supplied in a 4-ounce can with a small brush permanently attached to the lid. **Each** .... **$ .75**



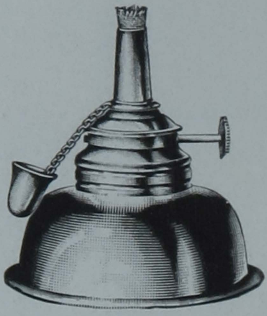
232M1



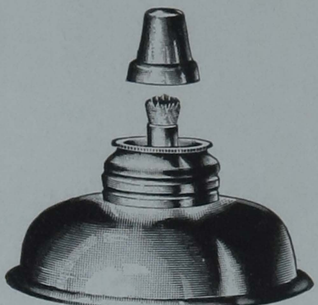
232M2



232M3



232M4



232M5

232M1 Lamps, Alcohol, Glass. Complete with ground-on cap to prevent evaporation.

Capacity, ounces	2	4	8
Each	**$ .25**	**.40**	**.60**

232M2 Lamps, Alcohol, Glass. With faceted body, permitting the use of the lamp in several positions.
Capacity, 4 ounces. **Each** . . . . . **$ .55**

232M3 Lamps, Alcohol, Glass. Heavy brass nickel-plated burner with screw cap.

Capacity, ounces	2	4	8
Each	**$ .35**	**.40**	**.60**

232M4 Lamps, Alcohol, Brass. Leak-proof, with ratchet feed wick and chained extinguisher cap.

Capacity, ounces	**3**	**5**	**8**
Diameter, bottom, inches	2⅞	3½	3½
Height, overall, inches	3½	3½	4
Each	**$ .75**	**.80**	**1.00**

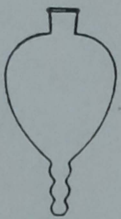
232M5 Lamps, Alcohol, Brass. Leak-proof, with gravity feed wick, and loose extinguishing cap.

Capacity, ounces	**3**	**5**	**8**
Diameter, bottom, inches	2⅞	3½	3½
Height, overall, inches	2½	2½	3
Each	**$ .75**	**.80**	**1.00**

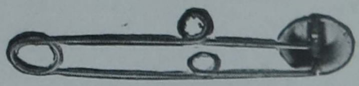
232M6 Lamp Wicks. Round, for alcohol lamps. Diameter, ¼ inch. **Dozen** . . . . . **$ .08**

50 Sheets
Japanese Lens Paper
The Mine & Smelter Supply Co.
Denver, Salt Lake and El Paso

232M7



232M9



232M10

232M7 Lens Paper. A soft, thin, silky paper for wiping lenses and optical instruments in general. Free of hard particles, dirt or grit. In book containing 50 sheets, 4x6 inches, perforated. **Book** . . . . . **$ .10**

232M8 Lens Paper. Same as 232M7, except supplied in sheets 7¼x10⅝ inches. **Package** of 50 sheets . . . . . **$ .20**

232M9 Leveling Bulbs. Of heavy glass with tubulature for rubber tubing.

Capacity, ml.	125	250	500
Each	**$ .75**	**1.00**	**1.25**

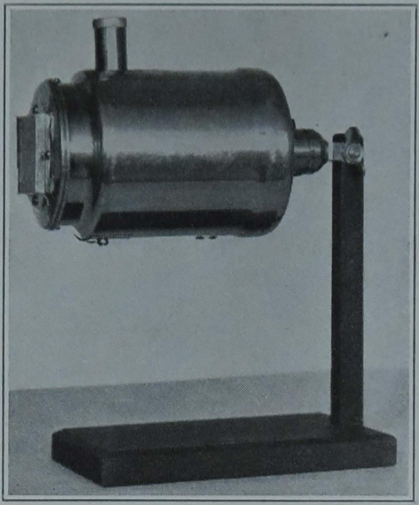
232M10 Lighters, Gas, Friction Type. Improved form. Round file in cup and replaceable tip. **Each** . . . . . **$ .35**

232M11 Lighter Flints. For 232M10. **Each** . . . . . **$ .10**

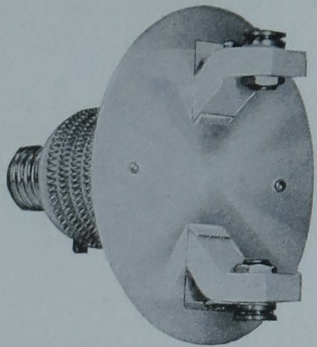
232M12 Lubriseal Stopcock Grease. Rust-proof lubricant. For use between either metal or ground glass surfaces. Expecially adapted and recommended for glass stopcocks. Put up in one-ounce tubes. **Tube** . . . . . **$ .50**

Luminescence

Fluorescent, Phosphorescent, and Radio-Active Apparatus and Material



233M1



233M14

233M1 Fluorescent Lamps, Ultraviolet. For fluorescent demonstrations and study of ultraviolet radiations. Consists of a photo lamp, 233M2, completely encased in a 4½-inch by 6½-inch polished aluminum cylinder, adjustable to various angles and having a 2-inch square ultraviolet filter in the removable cover at the front through which the rays are filtered before striking the material to be demonstrated.

Specimens may be inserted within the apparatus by removing the plate at the bottom and the effect viewed through the vertical tube at the top which may be uncapped. Complete with photo lamp and filter. **Each** **$10.00**
Note: Various filters for 233M1 lamp, see page 234.

233M2 Photo Lamp, Only. For 233M1 lamp. 750 watts with an average life of two hours. Operates in a standard lamp socket. Rich in ultraviolet. **Each** .... **$ .50**

233M3 Fluorescent Lamps, Argon. May be attached to the regular 110-volt light socket. Not as powerful as 233M2 lamp, but a satisfactory and inexpensive source of ultraviolet light where the demonstration may be carried out at a short distance from the light. **Each** .... **$ .75**

Fluorescent and Phosphorescent Plaques

233M4 Zinc Sulphide Compounds. Set of 5 plaques, each 2 inches square, fluorescing bright green, yellow, orange, red and blue. Also strongly phosphorescent in the same colors excepting the blue whose phosphorescence is very short. **Set** **$2.50**

233M5 Organic Chemicals. Set of 5 plaques, each 2 inches square, fluorescing green, yellow, orange, red and blue. **Set** .. **$2.50**

233M6 Fluorescent Minerals. Set of 5 plaques, each 2 inches square, consisting of Semi-Opal, fluorescing green, Wernerite, fluorescing golden yellow, Fluorite, fluorescing blue, Amber, fluorescing bluish green and Willemite, fluorescing green. Mineral pieces range in size from ⅛ to ¼ inch, only selected pieces to give the maximum luminous effect being used. **Set** **$2.50**

233M7 Fluorescent Plaques. Complete set of 15 plaques, 233M4, 233M5, 233M6, as described above. **Set** **$6.50**

Luminescent Compounds and Screens

233M8 Phosphorescent Zinc Sulphide. Strongly phosphorescent, also fluorescent. Green (used in making self-luminous materials), orange, red or blue. 25 gm. bottle, any color **$4.00**

233M9 Phosphorescent Calcium Sulphide. Phosphoresces a brilliant violet. 25 gm. bottle **$2.00**

233M10 Triboluminescent Zinc Sulphide. Phosphoresces a bright yellow. Small quantity placed on a glass and rubbed with the point of a knife emits brilliant sparks. 25 gm. bottle **$4.00**

233M11 Phosphorescent Zinc Sulphide Screens. 4x4 inches. Phosphoresces a brilliant green. **Each** **$2.00**

233M12 Phosphorescent Calcium Sulphide Screens. 4x4 inches. Phosphoresces a brilliant violet. **Each** **$1.00**

233M13 Triboluminescent Zinc Sulphide Screens. 4x4 inches. Phosphoresces brilliant yellow. Sparks on friction. **Each** **$2.00**
Note: Other colors than listed above can be furnished on request.

233M14 Arc Lamps. A useful laboratory lamp and excellent source for energizing various phosphorescent and fluorescent compounds. Consists of a porcelain body which carries a resistance coil of nichrome wire of about 600 watts capacity and across the terminals of which are placed two carbons. The apparatus may be screwed into the ordinary light socket for operation. The points of the carbon are brought into contact and then slightly separated which produces the arc. When the points are close together the arc will run for about 10 to 15 minutes without readjustment. Operates on 110-volt current, A. C. or D. C. Complete, including one pair carbons with insulating handles and one pair blue goggles. **Each** **$5.00**

233M15 Arc Lamp Reflectors. A bowl-shaped reflector for utilizing the infra red rays, produced by the resistance coil of 233M14 lamp. Used by inserting one carbon in both holes of the lamp, thereby eliminating the arc. Furnished with cord and attachment plug. **Each** **$3.00**

233M16 Lamp Carbons. For use in 233M14 arc lamp. **Box** of 10 .... **$1.50**

Luminescence, Continued

Glass Color Filters. For use in various demonstrations and experiments with phosphorescent and fluorescent radiations. The 2-inch sizes may be used with 233M1 lamps.

234M1 Ultraviolet Filters. Reddish purple in color. Will transmit .365Mu. ultraviolet, .405Mu violet and extreme red at about .72Mu. Furnished in squares. 2x2 inch. **Each, $1.00.** 6½x6½ inch. **Each** **$4.00**

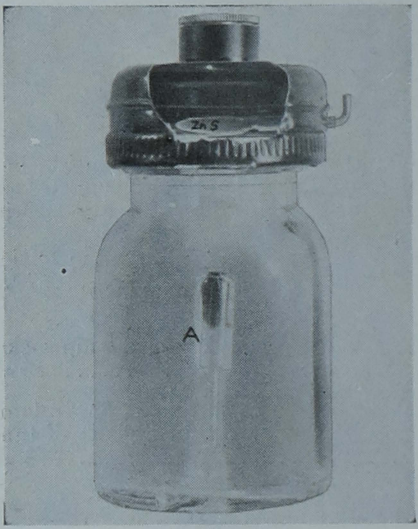
234M2 Red Ultra Filters. For isolating the .3888Mu. helium line for the study of the Raman effect. Furnished in squares. 2x2 inch. **Each, $1.00.** 6½x6½ inch. **Each** **$4.00**

234M3 Fluorescent Glass, Green. Fluoresces a brilliant green under the shortest ultraviolet radiation to visible blue at about .43Mu. Furnished in squares. 2x2 inch. **Each, $1.00.** 6½x6½ inch. **Each** **$4.00**

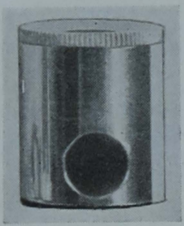
234M4 Fluorescent Glass, Blue. Fluoresces an intense blue under ultraviolet radiations of a wave length shorter than .310Mu. Furnished in squares. 2x2 inch. **Each, $ .75.** 6½x6½ inch. **Each** **$3.75**

234M5 Heat Transmitting Glass. Opaque to visible radiations, but transmits most of the infra red between 1Mu and 3Mu. Furnished in squares. 2x2 inch. **Each, $1.00.** 6½x6½ inch. **Each** **$4.00**

234M6 Heat absorbing Glass. Opaque to wave lengths greater than 5Mu. If used in connection with a water cell, either as one of the glasses forming the cell or simply immersed in water, there is almost complete absorption of the infra red. Furnished in squares. 2x2 inch. **Each, $ .75.** 6½x6½ inch. **Each** **$3.75**



234M7



234M8

234M7 Radioscopes. For detecting radioactivity in waters, ores, gases, etc., by the scintillation method. Consists of a 4-ounce glass bottle, 4 inches high, surmounted by a 2-inch metal cap, in which is placed a reversible zinc sulphide screen (glass disc coated on one side with zinc sulphide) attached to a spindle with lever handle projecting out through cap at right. When turned up, only the scintillations produced by the Radon radiations may be observed through the high-power magnifying lens at top of cap. When turned down, both the scintillations produced by the Radon radiations and directly from the material tested are visible. Removable baffle plate fitting into neck of bottle, consisting of two separated celluloid plates with offset holes prevents the direct radiations entering cap when making Radon tests. Cap may be used separately for testing ores, etc. The alpha ray tube is adjustable through a hole in the bottom of the bottle and is furnished for testing alpha ray ranges. The carnotite and radium bromide samples included may be tested directly or through the Radon evolved. Complete with ½-ounce carnotite, 1 microgram radium in 2 cc. radium bromide solution, baffle plate and alpha ray tube. **Each** **$10.00**

234M8 Radioscopes. Pocket instrument primarily for prospectors but valuable also for laboratory work. Used for detecting radioactivity in ores and minerals. Consists of a nickel-plated brass tube with a hole near the bottom for introduction of specimens to be tested. Tube contains a phosphorescent zinc sulphide screen for producing scintillations and a small sample of radioactive material for comparison. **Each** **$4.00**

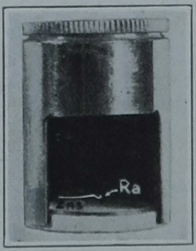
234M9 Radium Paint. High grade. For watches and small dials. Complete with necessary material for application and instructions. ½-gm. bottle **$5.00**

234M10 Radium Paint. For switchplates, signs, etc. Complete with necessary material for application and instructions. 1-ounce bottle **$3.00**

234M11 Radioactive Lead. Recovered from Colorado carnotite. Contains radium D, E and F. Highly radioactive, producing the two radiations, alpha and beta. Furnished in thin sheets. 2x2 inch. **Each, $3.00.** 2x4 inch. **Each, $5.00.** 2x10 inch. **Each** **$10.00**

234M12 Radium Extraction Demonstration Sets. Illustrates by means of representative specimens the extraction and purification of radium from the crude ore and the principal by-products obtained. Specimens are in 2-inch vials and include the following: Crude Carnotite Ore, Radium Barium Sulphate, Sodium Uranate, Sodium Vanadate, Radium Barium Chloride, Radium Barium Bromide and a crystal of Radium Barium Bromide weighing about 9.7 milligrams which represents the amount of Radium Bromide (contains 5.2 micrograms, radium element) which could actually be obtained from one ton of the ore furnished, if 100% extraction were possible. Complete with an explanation of the extraction and purification process. **Set** **$2.00**

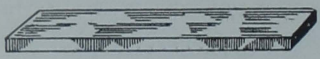
234M13 Polonium Plates. Have an alpha ray activity of about 5000 times that of radium. Prepared by deposition as an almost invisible film on a polished copper plate, 1 inch square. Used for experiments in luminosity and ionization. Discharges an electroscope instantly. **Each** **$1.00**



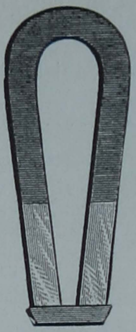
234M14

234M14 Spinthariscopes. Consists of a ¾x1-inch nickel-plated brass tube. A projection wire at the bottom contains a high activity radium sulphate on the under side of the wire. Includes a phosphorescent zinc sulphide screen and a high power lens. Thousands of scintillations are produced every minute, ¼ of them being due to radium and ¾ to Radon and its disintegration products. Furnished with instructions. **Each** **$4.00**

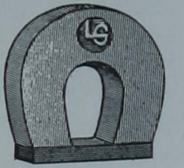
Magnets and Magnifiers



235M1



235M2



235M3

235M1 Magnets, Bar. Made of polished steel.

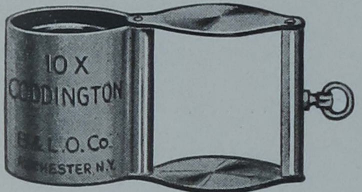
Length, inches	4	5	6
Each	**$ .20**	**.30**	**.40**

235M2 Magnets, Horseshoe.

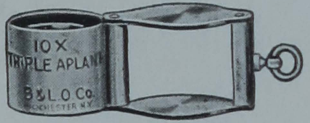
Length, inches	2	3	4	6
Each	**$ .12**	**.15**	**.45**	**.75**

235M3 Magnets, Alnico, Little Giant, Small. Aluminum-nickel-cobalt type. Very powerful. Weighs about 1/10 of a pound. Will lift approximately 5 pounds or about 50 times its own weight. Dimensions: 10x31x35 mm. **Each** ...... **$ .50**

235M4 Magnets, Alnico, Little Giant, Large. Same as 235M3, except dimensions are 16x38x45 mm. **Each** .. **$1.05**


10 X
CODDINGTON
B.&L.O.Co.
ROCHESTER N.Y.

235M5



235M6

235M5 Magnifiers, Coddington, B. & L. Gives good definition and a wide field. Made of a single piece of glass of cylindrical shape with a deep groove cut in the center and blackened to act as a diaphragm. The ends of the cylindrical-shaped glass are ground and polished to form lens surfaces.

Power	**7X**	**10X**	**14X**	**20X**
Focus, inches	1½	1	¾	½
Each	**$3.75**	**3.75**	**3.75**	**3.75**

235M6 Magnifiers, B. & L., Triple Aplanatic. With large field and perfect correction for chromatic aberration as well as flatness, astigmatism and distortion, new construction designed for highest grade work. Constructed of two meniscus lenses of flint glass cemented on each side of a double convex lens of crown glass.

Power	**7X**	**10X**	**14X**	**20X**
Focus, inches	1½	1	¾	½
Each	**$7.50**	**7.50**	**7.50**	**7.50**

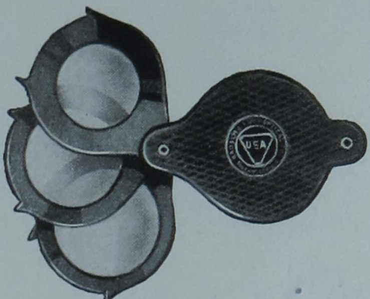
235M7

235M7 Magnifiers, Pocket Folding, B. & L. Single Lens. Oval shaped, hard rubber mountings.

Power	**5X**	**4X**	**3.5X**	**3X**
Diameter lens, mm.	20	25	30	37
Each	**$ .90**	**1.00**	**1.20**	**1.50**

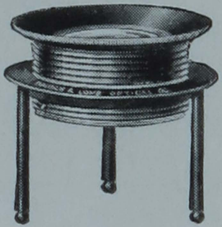
235M8 Magnifiers, Pocket Folding, B. & L. Double Lens. Oval shaped, hard rubber mountings.

Power	**5 to 10X**	**4 to 8X**	**3.5 to 7X**	**3 to 6 X**
Diam. lens, mm.	15, 20	20, 25	25, 30	30, 37
Each	**$1.50**	**1.80**	**2.00**	**2.40**

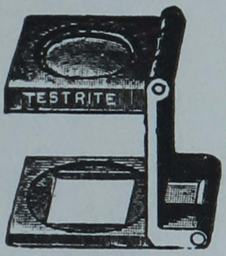


235M9

235M9 Magnifiers, Pocket Folding, B. & L. Triple Lens. Diameter of the three lenses is 12, 15 and 18 mm. Magnification is 6.0X to 20X. **Each** **$2.00**



235M10



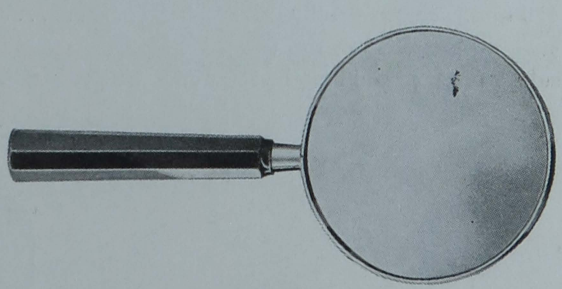
235M11

235M10 Magnifiers, B. & L. Tripod. Large clear field. The lens mounting screws up and down for focusing. Diameter lens, 25 mm. Power, 7.5X. **Each** .... **$ .75**

235M11 Magnifiers, Linen Testers, Brass.

Size, inches	¼x¼	½x½
Each	**$ .50**	**1.00**

235M12

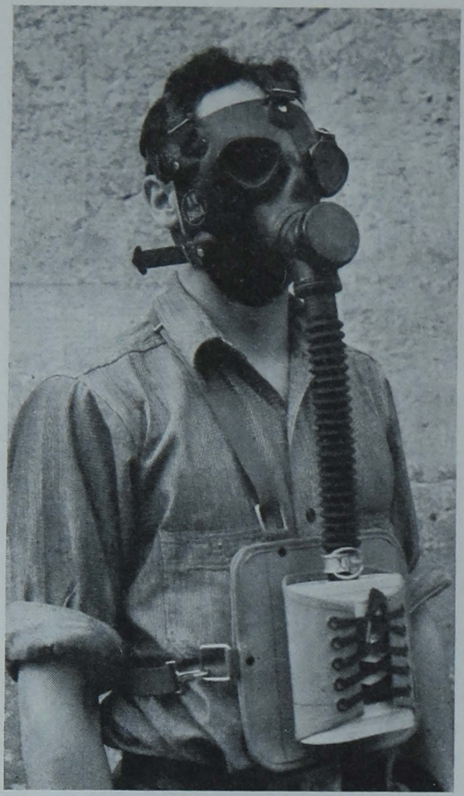


235M13

235M12 Magnifiers, Pencil Type. 25 power magnifiers for close examination of ores, metals, textiles, etc. Furnished with clip for carrying in pocket. **Each** **$1.25**

235M13 Magnifiers, Reading Glasses, B. & L., Round. Lenses are ground of clear, white ophthalmic glass. Chromium plated rims; ebonized wood handles.

Diameter lens, inches	**3**	**4**	**5**
Focus, inches	7	10	13
Each	**$2.25**	**3.00**	**4.50**



236M1

236M1 Masks, Gas, Canister Type. Consists of one-piece molded rubber facepiece, inhalation tube and connections, and carrying harness, complete in a strong weather-proof fibre carrying case. Shipping weight, 8 pounds. Net weight, 3½ pounds.

Regularly supplied with Type CM-80 canister but furnished with any canister as listed below at no extra charge.

Complete.......... $20.00

Canisters

Efficiency in absorption of gases is obtained where a specific gas or class of gases is to be met. In such case entire capacity of canister is taken up with one chemical absorbent. Following listing of canisters explains protective capacities of each.

236M2 Canister Type CM-1 Organic Vapors. Each.......... $2.50

236M3 Canister Type CM-10 Organic Vapors and Smoke. Each.......... $2.50

236M4 Canister Type CM-2 Acid Gases. Each.......... $2.25

236M5 Canister Type CM-20 Acid Gases and Smoke. Each.......... $2.25

236M6 Canister Type CM-3 Ammonia. Each.......... $2.25

236M7 Canister Type CM-30 Ammonia and Smoke. Each.......... $2.25

236M8 Canister Type CM-4 Organic Vapors and Acid Gases. Each $2.50

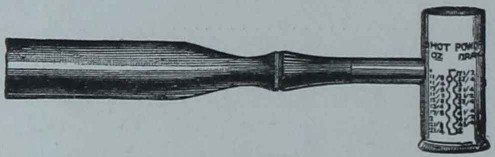
236M9 Canister Type CM-40 Organic Vapors, Acid Gases, and Smoke. Each.......... $2.50

236M10 Canister Type CM-7 Hydrocyanic Acid. Each.......... $2.25

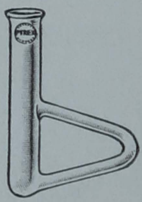
236M11 Canister Type CM-8 Organic Vapors, Acid Gases and Ammonia. Each.......... $2.40

236M12 Canister Type CM-80 Organic Vapors, Acid Gases, Ammonia and Smoke. Each.......... $2.40

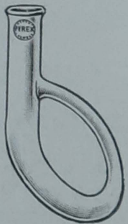
236M13 Matches, Safety. For general use in the laboratory. Packed in cartons of ten boxes. **Carton**.......... $ .10



236M14



236M15

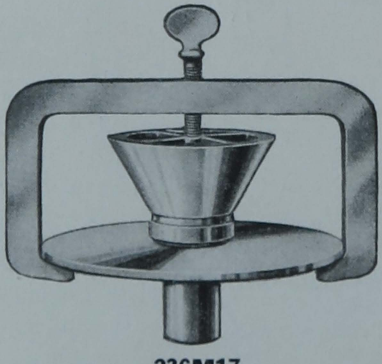


236M16

236M14 Measures, Lead. Improved construction, for test lead. **Each**.......... $ .25

236M15 Melting Point Tubes, Thiele, Pyrex. For melting point determination tests. Diameter, outside, 25 mm.; total length, 150 mm. **Each, $ .90. Case** of 12.......... $9.72

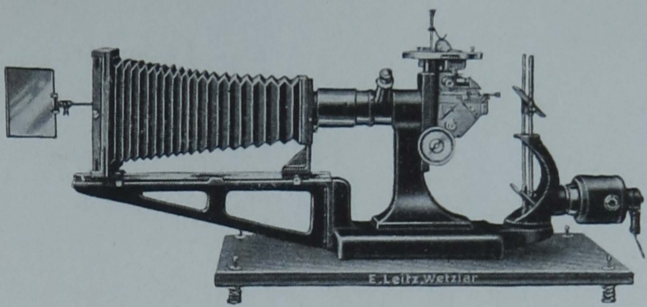
236M16 Melting Point Tubes, Thiele-Dennis, Pyrex. Modified in design to increase the rate of circulation. Diameter, outside, 25 mm.; total length, 150 mm. **Each, $1.20. Case** of 12.......... $12.96



236M17

236M17 Mercury Determination Apparatus, Whitton. For the determination of mercury in ores. Consists of a steel retort with a cover of sheet silver, and above these a flat-bottomed cooling dish of brass, all clamped tightly together. The distillation is thus performed in a closed retort, preventing the escape of mercury vapor, and rendering careful regulation of the heat unnecessary. The time required for an assay is about 30 minutes. Complete with one foil and directions, but without burner. **Each**.......... $8.00

Metallographic Apparatus



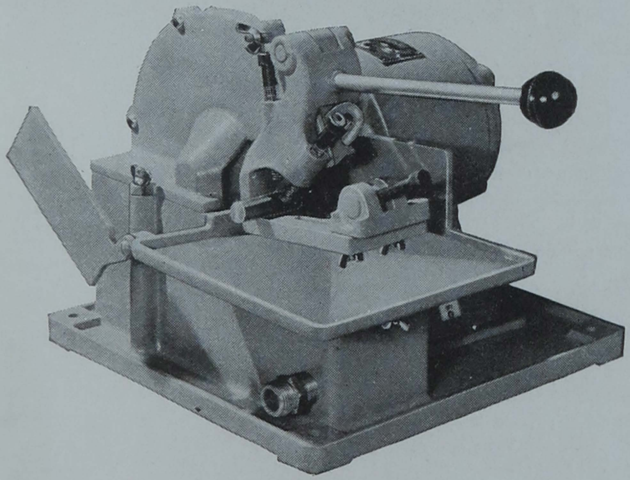
237M1

237M1 Metallographic Microscopes, Leitz. Consists of microscope stand, illuminating arrangement and camera on cast iron foot. The stand has rack and pinion coarse focusing motion and micrometer fine adjustment, compound mechanical stage (under the object stage device for attaching condensers for dark field illumination) with scale and vernier, complete interchangeable vertical illuminator for bright-field illumination, neutral tint glass for the protection of the eyes to slip upon the viewing eyepiece, and a set of object carriers.

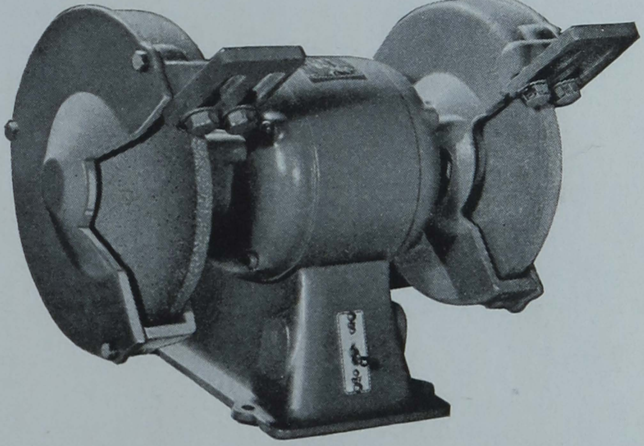
The illuminant is composed of a low-voltage, 6-volt, 5-ampere filament bulb in centering mount; adjustable helical mount with aspherical illuminating lens; flexible twin cord with plug and coupling for connecting low voltage filament to transformer (or resistance); and the supply system, 5 feet long with two renewal bulbs. Incorporated within the illuminating arrangement is a holder with green filter to slip in for photo-micrographic work; ground glass plate for visual observation; and mirror system for conveying rays of light to the microscope.

The camera is horizontal, with extensible bellows 50 cm. long on two saddle stands capable of displacement along prismatic bench with cm. divisions; time and instantaneous shutter fitted to the camera front; one ground glass and one clear glass focusing screen; two plate masks; focusing lens; two plate holders with adapters for plates 5x7 inches and 4¼x3¼ inches; and light-proof connecting ring. The camera is detachable and can be utilized for taking microscopic photographs with long focus photo-lenses on a separate stand. A box is supplied for the accommodation of the objectives and other small detachable parts. A wide variety of objectives, eyepieces, and accessories is available. Prices on application.

Note: A complete catalog of the above microscope with prices and detailed information will be sent upon request.



237M2



237M6

237M2 Specimen Cutters. For high speed cutting of metallographic specimens to convenient size. Specimen protected from overheating by water stream cooling arrangement. Cutting assembly and motor are each totally enclosed. The ½ H. P. motor is ball bearing; has a speed of 3450 R. P. M.; and is for use on 110 volts, 60 cycles, single phase, A. C. Specimen holder and clamps, to accommodate various shapes up to 1¼ inches in diameter, are on swing arm with operating handle. The cut-off wheel is 9x$\frac{1}{16}$x⅝ inches. Complete with 10-foot cord, switch and plug; mounted on cast base, 20x17x18 inches. Shipping weight, 92 pounds. **Each** **$110.00**

237M3 Cut-Off Wheels. 9x$\frac{1}{16}$x⅝ inches. **Each** **$1.50**

237M4 Combination Specimen Cutter and Grinder. Same as 237M2, except equipped also with 8x¾x⅝-inch grinding wheel with guard, mounted at right hand side. **Each** **$120.00**

237M5 Floor Pedestal. For 237M2 and 237M4. Height, 29¾ inches; base, 16x16 inches. Shipping weight, 90 pounds. **Each** **$35.00**

237M6 Specimen Bench Grinders. The ⅓ H. P. ball bearing motor is totally enclosed; has a speed of 1750 R. P. M.; and is for use on 110 volts, 60 cycles, single phase, A. C. Two special grinding wheels, one coarse and one medium, and special wheel guards, to give maximum surface latitude, are provided. Complete with 10-foot extension cord and plug on high base with control switch. Shipping weight, 76 pounds. **Each** **$40.00**

237M7 Grinding Wheels, Coarse. For non-ferrous metals. 8x½x½ inches. **Each** **$3.50**

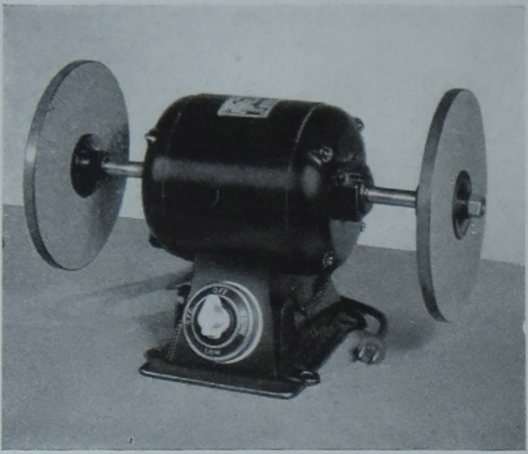
237M8 Grinding Wheels, Coarse. For ferrous metals. 8x½x½. **Each** **$3.50**

237M9 Grinding Wheels, Medium. For non-ferrous metals. 8x½x½. **Each** **$3.50**

237M10 Grinding Wheels, Medium. For ferrous metals. 8x½x½. **Each** **$3.50**

237M11 Floor Pedestal. Height, 33¼ inches. Shipping weight, 35 pounds. **Each** **$15.00**

Metallographic Apparatus, Continued

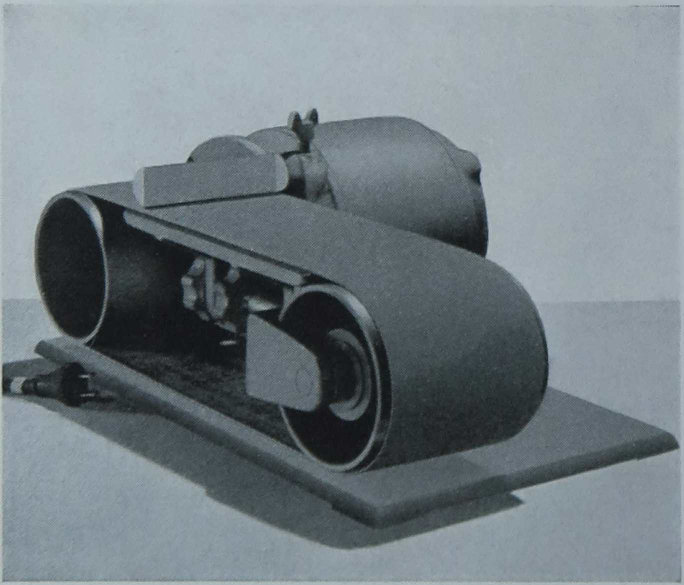


238M1

238M1 Emery Paper Disc Grinders. For fine dry grinding. Four grades of selected emery paper discs may be attached to the two polished Bakelite, 8⅛-inch wheels. No paste nor cement is necessary as two sets of special paper holding bands are provided for this purpose. The motor is a ball bearing, totally enclosed type, ⅓ H. P., with two speeds, 575 and 1150 R. P. M., for use on 110-volt, 60-cycle, single phase A. C. Complete with one dozen each of Nos. 1, 0, 00 and 000 emery paper discs, control switch, 10-foot cord and plug. Shipping weight, 75 pounds. **Each** **$52.00**

238M2 Emery Paper Polishing Discs. Diameter, 8 inches; with ½-inch center hole. Specify grit No. 2, 1, 0, 00, 000 or 0000. **Hundred** **$3.80**

238M3 Floor Pedestal. Height, 33¼ inches. Shipping weight, 35 pounds. **Each** **$15.00**



238M4

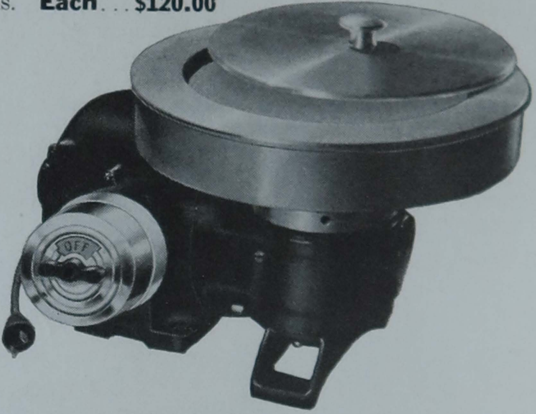
238M4 Belt Surfacers. For straight line finish in the intermediate stages of specimen preparation. Direct motor drive, ⅓ H. P. motor is for use on 110-volt, 60-cycle, single phase, A. C. Ball bearing pulley is 4 inches in diameter by 4½ inches face; the work table, 7½ inches by 4½ inches; seamless abrasive belt, 36 inches long by 4 inches wide. Complete with control switch, 10-foot extension cord and plug for connection to light socket. Shipping weight, 95 pounds. **Each** . . **$76.00**

238M5 Abrasive Belt. Aloxite continuous cloth. Specify grit No. 50, 80, 120, 180, 250 or 320. **Each** . . . . **$ .75**

238M6 Floor Pedestal. Height, 29¾ inches; base, 16x16 inches. Shipping weight, 90 pounds. **Each** **$35.00**

238M7 High Speed Polishers. Equipped with 8-inch balanced polishing disc and adjustable band to hold polishing cloth; aluminum-alloy polishing bowl with drain, cover, removable hand rest and splash ring. Mounted directly to ¼ H. P. motor of speed 575 to 1150 R. P. M., for 110-volt, 60 cycle, single phase, A. C., with anti-friction bearings, dynamically balanced to operate free from vibration. A specially designed end bearing for vertical operation eliminates end thrust. Complete with two-speed snap switch, 10 foot rubber cord, plug, and directions. Shipping weight, 67 pounds. **Each** . . . **$120.00**

238M7



238M8

238M8 Low Speed Polishers. Equipped with 8-inch balanced bronze polishing disc and adjustable band to hold polishing cloth; aluminum-alloy polishing bowl with drain, cover, removable hand rest and splash ring. Mounted directly to ¼ H. P. ball bearing motor, for 110-volt, 60-cycle, single phase A. C.; with right angle radial and thrust bearing gear reduction to supply approximately 250 R. P. M. spindle speed. Complete with snap switch, 10-foot rubber cord and plug, and directions. Shipping weight, 70 pounds. **Each** . **$155.00**

Accessories

238M9 Aluminum Alloy Polishing Disc. Carefully balanced. With adjustable band to hold cloth. **Each** **$9.00**

238M10 Bronze Polishing Disc. Otherwise, same as 238M11. **Each** **$11.50**

238M11 Uniwax Aluminum Alloy Polishing Disc. Carefully balanced. With adjustable high band. Complete with one pound of Uniwax. **Each** **$9.00**

238M12 Mechanical Holder. For three specimens. Complete with three specimen weights and transparent dust cover. **Each** **$28.00**

238M13 Selvyt Polishing Cloth. 10x10 inches. **Dozen** **$3.80**

238M14 Kitten-Ear Polishing Cloth. 10x10 inches. **Dozen** **$3.80**

238M15 Silk Polishing Cloth. 10x10 inches. **Dozen** **$3.80**

238M16 Metallographic Polishing Alumina, No. 1. Recommended for steel and cast iron. **4 ounces** **$3.20**

238M17 Metallographic Polishing Alumina, No. 2. Recommended for brass and bronze. **4 ounces** **$4.00**

238M18 Metallographic Polishing Alumina, No. 3. Recommended for zinc and lead. **4 ounces** **$5.80**

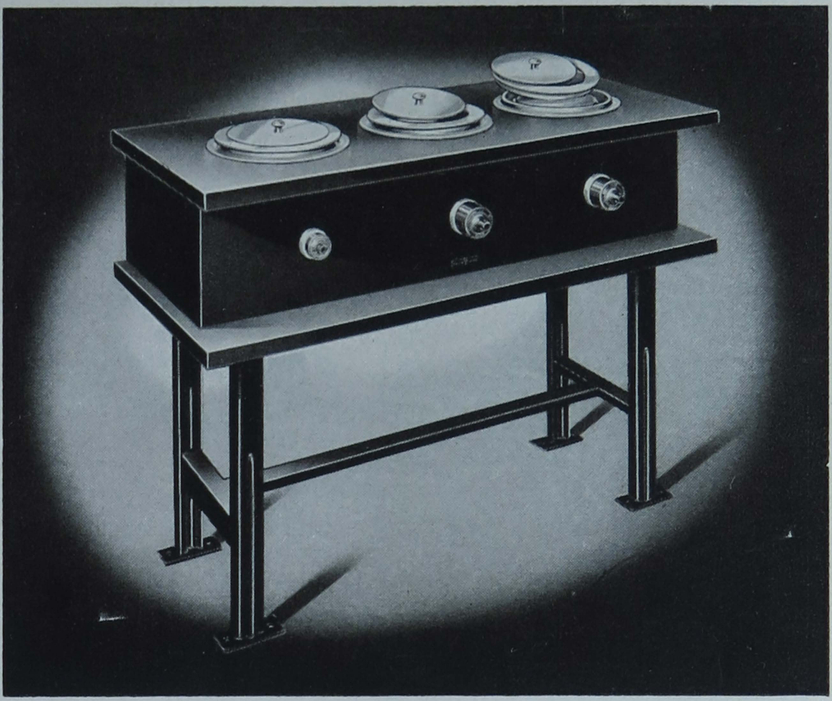
238M19 Levigated Shamva Powder. One pound . . **$4.80**

238M20 Emery Paper, "French." Especially for metallographic use.

Grade, No.	0000	000	00	0	1	1G	2
Sheets, 9x13¾ in. **Per 100** . . .	**$4.50**	**4.50**	**4.50**	**4.50**	**4.50**	**4.50**	**4.50**

Metallographic Apparatus, Continued

239M1



239M4

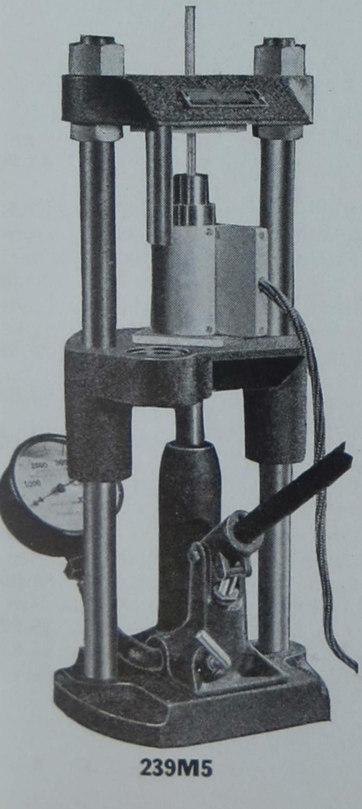
239M1 Polishing Stands, Single Unit. The gray cast-iron pedestal is carefully designed to assure vibrationless stability and leg room for the operator when seated. It is drilled for lag-screw floor mounting. The table top is Linotile covered.

The stand is equipped with a specimen washing fountain located within an aluminum cast bowl provided with plumbing connections. In addition to a shut-off valve, a pressure control valve is placed in the water line. A constant flow of water prevents contamination of subsequent polishing operations. Complete with polisher, 238M8 and directions. **Each** **$260.00**

239M2 Stool. For 239M1. Adjustable for height; adjustable range, 18 to 24 inches. Made of steel, with ball bearing seat swivel and composition casters. Seat is brown hardwood; metal parts are olive green. **Each** **$11.50**

239M3 Polishing Tables, Two-Unit. Complete with two polishers, 238M7 and 238M8. Dimensions, 40x25 inches. Shipping weight, 600 pounds. **Each** **$350.00**

239M4 Polishing Tables, Three-Unit. Complete with three polishers: two 238M7 and one 238M8. Dimensions, 54x24 inches. Shipping weight, 360 pounds. **Each** **$475.00**



239M5

239M5 Specimen Mount Presses. 5000-pound capacity. For mounting specimens in molded plastic mounts under heat and pressure in 1-inch or 1¼-inch diameter molds. An ejector is built-in for removing mounts from molds.

Complete with 5000-pound hydraulic gauge, thermometer of range 200° C., 1-inch mold assembly, 200-watt electric heater for 1-inch mold for 110 or 220 volts A. C. or D. C., and directions. When ordering, specify current characteristics. **Each** **$120.00**

239M6 Specimen Mount Presses. 10,000-pound capacity. Same as 239M5, except of larger capacity.

Complete with 10,000-pound hydraulic gauge, thermometer of range 200° C., 1-inch mold assembly, 200-watt electric heater for 1-inch mold for 110 or 220 volts A. C. or D. C., and directions. When ordering, specify current characteristics. **Each** **$150.00**

239M7 1-Inch Mold Assembly. Each **$25.00**

239M8 1¼-Inch Mold Assembly. Each **$32.00**

239M9 Mold Coolers.

For mold, size, inches	1	1¼
Each	**$15.00**	**17.00**

239M10 Mold Heaters, Electric. For 110 or 220 volts A. C. or D. C. When ordering, specify current characteristics.

For mold, size, inches	1	1¼
Each	**$15.00**	**20.00**

Plastic Mounting Mediums

239M11 Bakelite Mounting Powder, Black. One pound, **$ .40. Five Pounds** **$1.75**

239M12 Bakelite Mounting Powder, Red. One pound, **$1.00. Five pounds** **$3.35**

239M13 Bakelite Mounting Powder, Translucent. Extra hard, amber. **One pound** **$1.35**

239M14 Transoptic Mounting Powder. One pound **$1.35**

239M15 Lucite (Du Pont) Mounting Powder. Hard, crystal clear. **One pound** .. **$1.50**

Note: For Carver Laboratory Hydraulic Press, see page 323.

Micro Chemical Apparatus

An endeavor has been made to list, within the scope of this catalog, the more common and standard items of interest to the microchemist. Due to the rapid changes in the technique of microchemical methods with new and improved forms of apparatus, we are anticipating the demands for such items as do not appear in the following section by being prepared to quote apparatus from any of the usual journals and publications describing such items. To enable us to quote promptly, please give the name of the publication, the date published, the page, and, when necessary, the paragraph wherein the apparatus desired appears.

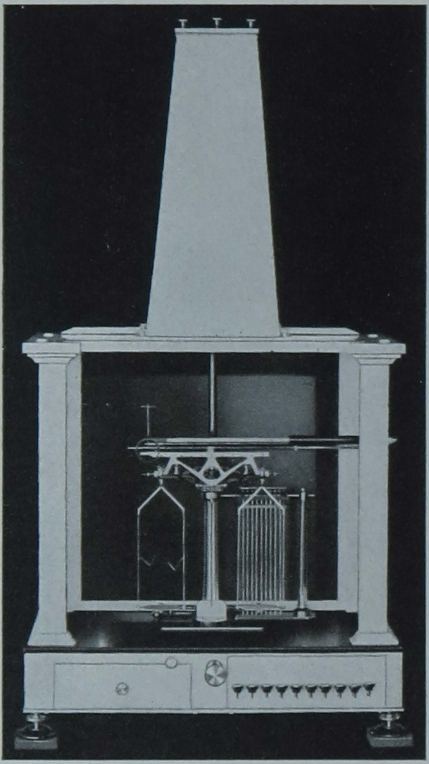
All references to Pregl except as otherwise noted are from "Quantitative Organic Microanalysis of Fritz Pregl"—Roth, H. & Daw, E. B. (P. Blackiston's Son & Co., Inc., Philadelphia, Pa.) 1937.

References to Niederl are from "Organic Quantitative Microanalysis," J. B. Niederl & V. Niederl (J. Wiley & Sons, Inc., N. Y.) 1938.

References to Emich-Schneider are from "Microchemical Laboratory Manual," F. Emich, F. Schneider (J. Wiley & Sons, Inc., N. Y.) 1932.

Small sizes of standard forms of laboratory apparatus suitable for micro analysis are to be found elsewhere in the catalog in their respective order of listing.

We are indebted to E. W. D. Huffman of Denver, Colorado, for assistance in compiling this section.



240M4

Balances, Micro, Ainsworth.

CAPACITY: 20 grams on each Pan.*

SENSITIVITY: Types FD and FDM: 10 divisions for 0.1 mg.; estimation in gamma (0.001 mg.).
Types FDJ, FDK, and FDI: 10 divisions for 0.01 mg.; estimation in fractions of gamma.

BEAM: 5 inches long of hard rolled aluminum alloy, profiled from a solid slab with edges of triangular shaped agate swaged into place, thus assuring permanent accuracy. The beam is graduated from left to right into 100 spaces. There are 201 notches, each notch representing half a space on the beam. Thus a 5 mg. rider may be set to the nearest 50 gamma and a 0.5 mg. rider to the nearest 5 gamma. The maximum error in the notching of the beam and also in the graduation of the index is $2x10^{-4}$ inches. In terms of the 5 mg. rider this is equivalent to 0.4 gamma; in terms of the 0.5 mg. rider, 0.04 gamma.

ZERO POINT ADJUSTMENT: A small extension fastened to the left end of the beam having ten graduations and carrying a 0.5 mg. rider is used for the final adjustment of the zero point and for readjustment if there is variation in the zero point during the analysis. The adjustment is made from outside the case by means of the rider carrier. The graduations permit rapid and accurate adjustment.

EDGES: Of hard, clear, white agate, polished with optically accurate contact angles.

PLANES: Of hard, clear, white agate polished optically flat.

HANGERS: Sides of strong heat treated aluminum alloy turned and formed for maximum strength. Height, 6¼ inches, width, 2 inches, with plates of same alloy 1½ by 2 inches. Both right and left hangers are equipped with hooks for holding absorption tubes and similar apparatus to aid in accurate taring.

RIDER CARRIER: Operates clear across beam and handles both the weighing rider and the zero adjustment rider.

BEAM RELEASING MECHANISM: Is of radial drop lever type.

PAN RESTS: Of greatly improved design. Independently operated with push button on front of case.

CASE: All aluminum, finished in white. The floor of the case is 7 inches by 16 inches giving ample room for the various tares.

OPTICAL LEVER: By means of this device great magnification is obtained without the use of a reading lens thus eliminating the errors due to parallax, etc. A narrow, intense beam of light moves across a scale that is graduated with zero center and 100 spaces each side of zero. Each space is approximately 0.5 mm. (0.020 inches) and is equal to 1 gamma. One-fourth gamma may be estimated easily.

KEYBOARD OPERATED WEIGHT CARRIER: By use of this device one avoids handling all fractional weights up to and including 100 mg. having available a total of 221 mg. Since the weights are not handled they remain remarkably constant over long periods of time. It is not necessary to open the case to add the weights, thus speeding up the weighing and making for greater accuracy. Also, frequent retaring of absorption tubes, etc., is not necessary.

240M1 Balances, Micro, Ainsworth, Type FD. Simple microchemical balance furnished with the usual 5 mg. rider and with a sensitivity of ten divisions on the pointer index for a change in load of 0.1 mg. (0.1 mg. equals two notches on the beam). A compound magnifier with corrected lenses is furnished for reading the pointer index to aid in estimating tenths of a division (one gamma). Extra fractional weights are added by hand. **Each** **$310.00**

240M2 Balances, Micro, Ainsworth, Type FDI. Similar to type FD, except that the optical lever is employed, eliminating the use of a magnifying lens and permitting direct readings in gamma. **Each** **$425.00**

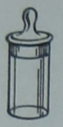
240M3 Balances, Micro, Ainsworth, Type FDM. Similar to type FD, except that it is equipped with a keyboard operated weight carrier allowing the use of a 0.5 mg. rider, thus decreasing the magnitude of the error in placing the rider and permitting the mechanical addition of fractional weights up to 221 mg. As in type FD the sensitivity is ten divisions on the pointer scale for 0.1 mg. corresponding in this case, however, to twenty notches on the beam. **Each** **$440.00**

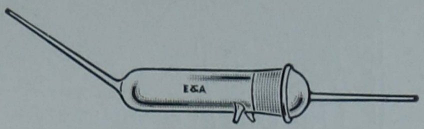
240M4 Balances, Micro, Ainsworth, Type FDJ. Has the combined advantages of the optical lever and the keyboard operated-weight carrier. Due to the decrease of the magnitude of the error in placing the rider, the direct readings in gamma and the mechanical addition of the fractional weight, the accuracy of the weighings is greatly enhanced. With great care in manipulation one is justified in estimating fractions of gamma. **Each** **$555.00**

240M5 Balances, Micro, Ainsworth, Type FDK. For highest type of precision work. Similar to type FDJ, except with weight carrier on both sides. This arrangement permits rapid intercalibration of the fractional weights under ideal conditions, there being no necessity for handling a weight or opening the case during the procedure. **Each** **$750.00**

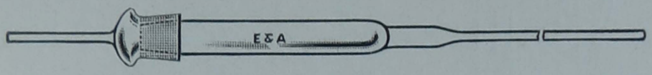
*Capacity: 50 grams may be placed in each pan without damage to the balance, but some sacrifice of sensitivity and accuracy will naturally accompany this added load.

Micro Chemical Apparatus, Continued


241M1



241M2



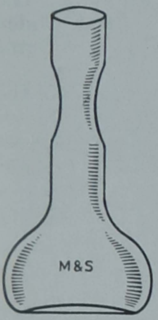
241M3

241M1 Bottles, Weighing, Micro, Niederl Page 34. Height without stopper, 5 mm. Diameter, 4 mm. **Each**. $1.00

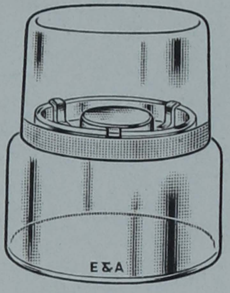
241M2 Bottles, Weighing, Micro, Pregl Page 55. "Piggie." To accommodate the 17 mm. boat. **Each**............$ .75

241M3 Bottles, Weighing, Charging Tubes, Micro, Pregl Page 79. Long type. With ground cap. Length, 115 mm. **Each**..$ .95

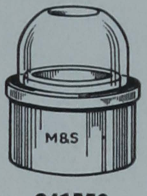
241M4 Bottles, Weighing, Micro. With open end. Length, 145 mm. Otherwise, same as 241M3. **Each**..........$ .45



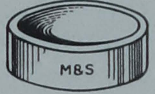
241M5



241M8



241M9



241M10

241M5 Bottles, Tare, Micro, Pregl Page 14. Numbered. With open top. **Each**.................................$ .30

241M6 Bottles, Tare, Micro. With glass stopper. Otherwise same as 241M5. **Each**.......................$ .75

241M7 Lead Shot. 4-ounce **bottle**..................$ .45

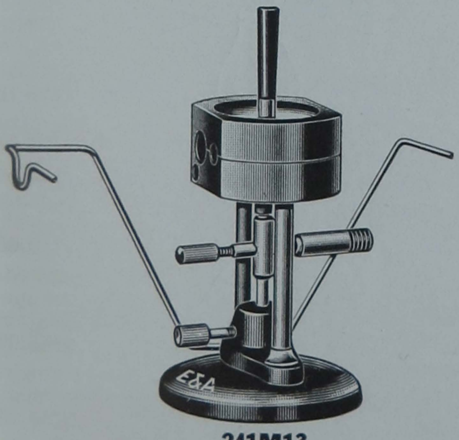
241M8 Desiccators, Glass, Micro. Diameter, 4 inches. Complete with metal tray support and weighing block. **Each**..$7.30

241M9 Desiccators, Micro, Niederl Page 23. Consists of an aluminum base, weighing block and glass dome. **Each**..$6.00

241M10 Weighing Blocks, Micro, Pregl. For use with 241M8 and 241M9, or separately. Diameter, 40 mm.; height, 12 mm. **Each**...................................$1.80

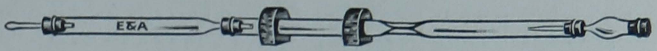
241M11 Combustion Boats, Micro Pregl. Platinum. **Each**..$5.00

241M12 Kroenig Cement. For ground joints. **Stick**.$ .80



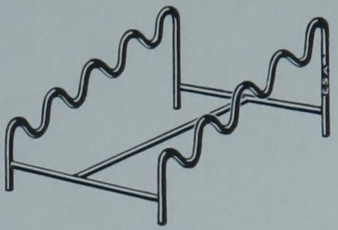
241M13

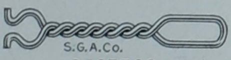
241M13 Regenerating Blocks, Micro, Pregl Page 98. For vacuum drying and the drying of filter tubes. Complete with thermometer and 241M14 chamber. **Each**......$21.50



241M14

241M14 Vacuum Chamber, Micro, Pregl Page 53. Glass parts only for use with 241M13. **Complete**..........$2.00

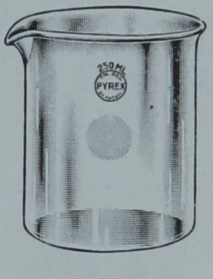

241M15



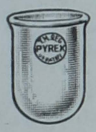
241M16

241M15 Wire Stands, Micro. For holding absorption tubes. **Each**..$1.10

241M16 Wire Forks, Micro. For manipulating absorption tubes. **Each**..$ .30



241M17



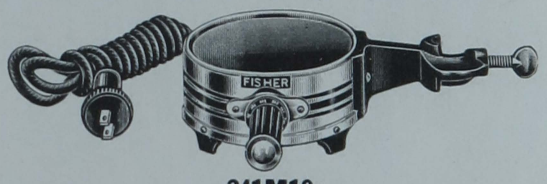
241M18

241M17 Beakers, Micro, Pyrex. Griffin form with spout.

Capacity, ml.	5	10	20
Each	$ .22	.22	.20

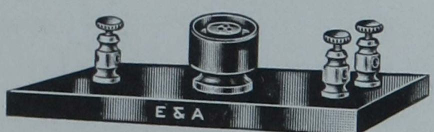
241M18 Beakers, Micro, Pyrex. Round bottom.

Capacity, ml.	5	10
Each	$ .22	.22



241M19

241M19 Hot Plates. A thermostatically controlled hot plate for general use in the laboratory. Diameter, 4⅛ inches; height, 3 inches. Maximum temperature, 200° C. Current consumption, 750 watts. For operation on 110 volts A. C. **Each**..$5.00

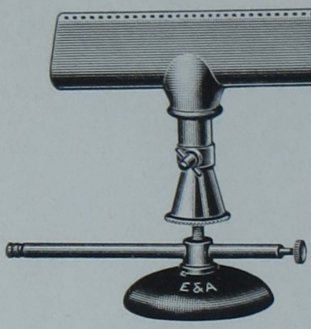


241M20

241M20 Electrolytic Cells, Micro. For electro deposition of minute amounts of material to be detected microscopically. Consists of a hard rubber plate 3x1 inches with 3 binding posts and wire connections; a hard rubber support with threaded hard rubber collar for raising and lowering the cover glass for making contact with the drop; and 3 platinum wires of 0.1 mm. diameter, mounted in the hard rubber support, 2 of the wires serving as cathode and one as anode. Current should be supplied from a low voltage rectifier with rheostat. Complete with three platinum electrodes, but without rheostat. Ref.: Microchemie IX, 395 (1931). **Each**......$25.00

Small sizes of standard forms of laboratory apparatus are to be found elsewhere in the catalog.

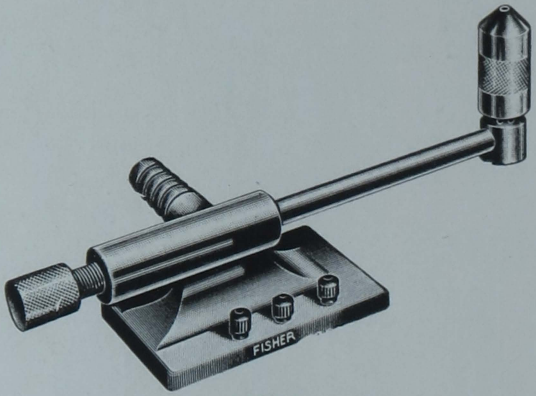
Micro Chemical Apparatus, Continued



242M1

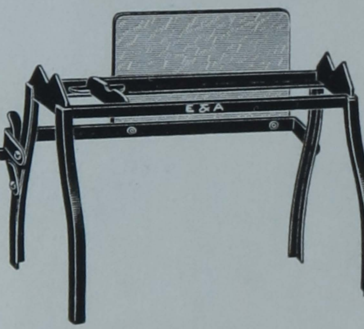
242M1 Burners, Long Type, Bunsen. As employed for micro combustion. Length of cast aluminum manifold, 7 inches. Provided with needle valve and adjustable air inlet. For artificial gas. **Each**.......... **$15.00**

242M2 Burners, Long Type, Bunsen. Same as 242M1, except for natural and mixed gases. **Each**.............. **$15.00**



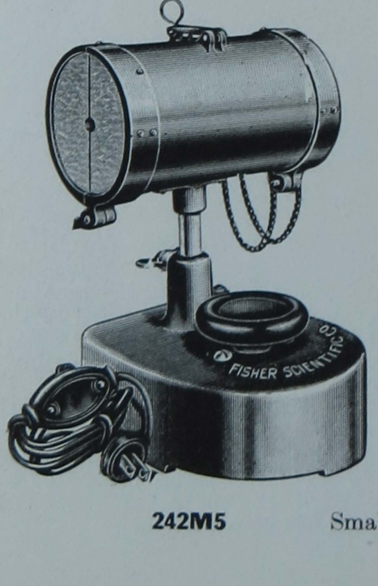
242M3

242M3 Burners, Micro, Fisher. Made of brass with four interchangeable tips and needle valve control. Provides a sharp, hot flame of small size. The interchangeable tips adapt the burner to many uses. **Each**..................... **$3.75**



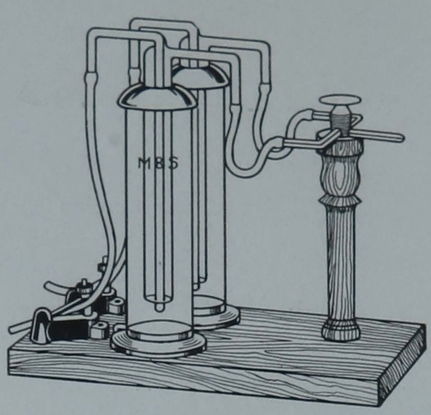
242M4

242M4 Stands, Combustion, Micro. For support of the combustion tube. Length, 300 mm. Height of tube trough, 230 mm. **Each**.................................. **$7.50**

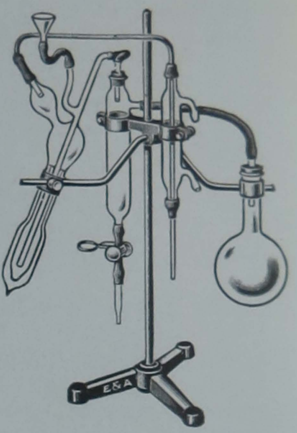


242M5

242M5 Furnaces, Combustion, Micro, Electric, Fisher. With hinged sections; and adjustable in height for fitting standard micro trains. Built-in rheostat furnishes a temperature range of 1100° to 1800° F. Heating elements are replaced readily. Furnace is 20 cm. long; designed for use with the standard 12 mm. micro combustion tube. Current consumption, 300 watts. For operation on 110 volts A. C. or D. C. **Each**............ **$45.00**



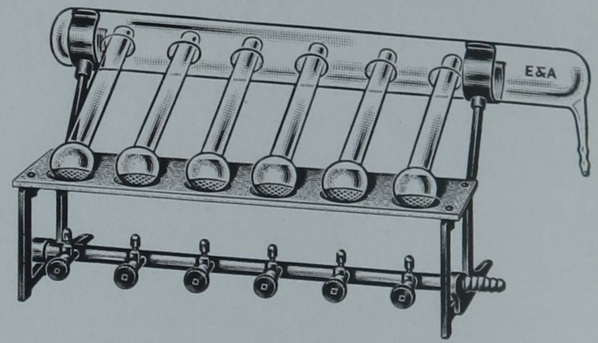
242M6



242M7

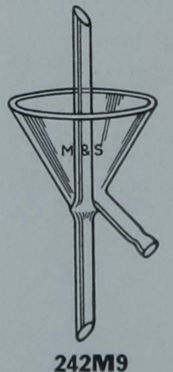
242M6 Pressure Regulators, Combustion, Micro, Pregl Page 19. Complete as illustrated, with wood base and mounting. **Each**...................................... **$18.75**

242M7 Nitrogen Distillation Apparatus, Micro, Kjeldahl, Pregl-Parnas-Wagner Page 88. Complete as illustrated with support stand and clamp for assembling. **Each** . **$31.50**
Note: for burette, see page 246.

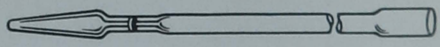


242M8

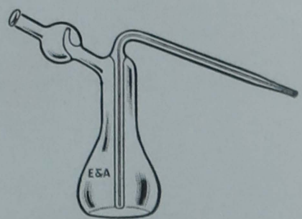
242M8 Nitrogen Digestion Apparatus, Micro, Kjeldahl, Pregl Page 89. 6-Place. For conducting multiple digestions in the micro Kjeldahl determination of nitrogen. Complete with Pyrex glass fume duct and six flasks. **Each**..... **$30.00**



242M9



242M11



242M12

242M9 Funnels, Steaming, Micro. Each.......... **$3.85**

242M10 Flasks, Erlenmeyer, Micro, Quartz. As used in Kjeldahl determinations.

Capacity, ml.	25	50	100
Each	**$5.30**	**7.15**	**10.50**

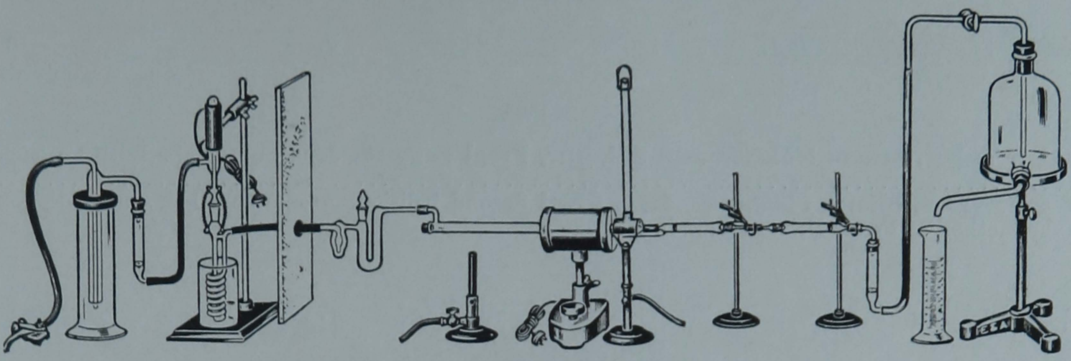
242M11 Pipettes, Washout, Micro, Pregl Page 90. Calibrated to contain; and furnished with certificate of calibration.

Capacity, ml.	0.1	0.5	1.0	1.5
Each	**$2.25**	**2.25**	**2.25**	**2.25**

242M12 Bottles, Washing, Micro, Alber. Capacity, 50 ml. **Each**.. **$2.50**

Small sizes of standard forms of laboratory apparatus are to be found elsewhere in the catalog.

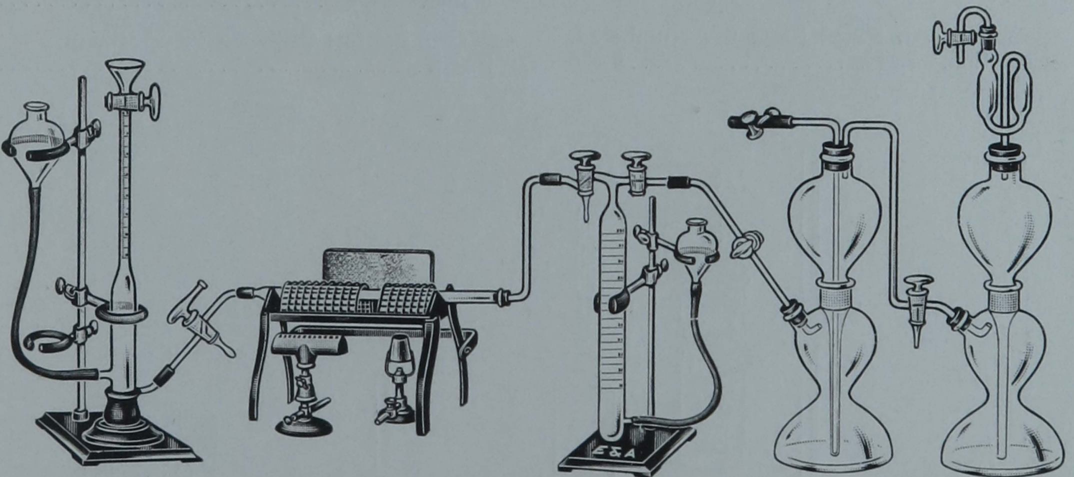
Micro Chemical Apparatus, Continued



243M20

Combustion Apparatus, Micro, Carbon and Hydrogen, Niederl Page 80. Employs oxygen and is equipped with electrically heated quartz preheater and combustion tube of Supremax glass heated by an electric furnace. The apparatus consists of the following:

243M1 Needle Valve. For 110 cu. ft. oxygen cylinder. **Each**	$5.00
243M2 Precision Pinch Clamp. **Each**	$2.50
243M3 Single Pressure Regulator Unit. **Each**	$3.75
243M4 Calcium Chloride Drying Tubes. Two supplied. **Pair**	$1.50
243M5 Quartz Preheater Unit. Copper oxide filler. With combustion chamber, glass condenser, stand, clamp and electric heater for 110 volts. **Each**	$33.00
243M6 Asbestos Shields. Two supplied. **Pair**	3.00
243M7 Niederl Type U-Tube and Bubble Counter. **Complete**	$2.20
243M8 Support with Hook Clamp (High). **Complete**	$1.75
243M9 Wire Suspension Hook. **Each**	$ .30
243M10 Combustion Stand Unit. Consists of one short nichrome gauze roll, burner with pilot and chimney, and electric combustion furnace with rheostat for 110 volts. **Each**	$47.35
243M11 Combustion Tube. Side arm. Supremax. 500 mm. chamber. **Each**	$1.50
243M12 Constant Temperature Device. **Each**	$18.50
243M13 Support with Hook Clamp (Short). Two supplied. **Pair**	$3.50
243M14 Absorption Tube. 80 mm. **Each**	$2.20
243M15 Absorption Tube. 10 mm. **Each**	$2.20
243M16 Mariotte Bottle Unit. Consists of stand, 2-liter bottle, stopcock, syphon tube and 250 ml. graduate. **Each**	$7.70
243M17 Rubber Tubing. 4 mm. inside diameter. Aged. **Per Meter**	$ .50
243M18 Rubber Tubing. Heavy wall-impregnated. **Per Meter**	$1.65
243M19 Rubber Stoppers, Solid. 12 supplied. **Dozen**	$ .50
243M20 Combustion Apparatus, Micro, Carbon and Hydrogen, Niederl. Complete as listed above—243M1 to 243M19, inclusive. **Each**	$138.60



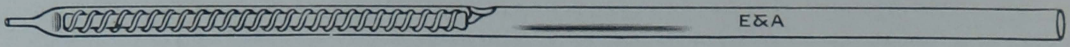
243M30

Combustion Apparatus, Micro, Nitrogen, Dumas, Niederl Page 60. For the quantitative micro determination of nitrogen by the Dumas method using a modified Pregl assembly. The apparatus consists of:

243M21 Mercury Gasometer Unit. Consists of gasometer proper, leveling bulb, rubber tubing, and a stand with clamps, without mercury. **Complete**	$15.10
243M22 Rubber Stoppers. One-hole. 12 supplied. **Dozen**	$ .50
243M23 Combustion Stand Unit. Consists of combustion stand, one each short and long nichrome gauze rolls, one each short and long nichrome gauze tunnels, long burner and burner with pilot and chimney. **Complete**	$25.75
243M24 Kipp Generators. 2-liter. Two supplied. **Pair**	$29.00
243M25 Capillary Bayonet Tube. **Each**	$ .50
243M26 Combustion Tube. Straight; Supremax. **Each**	$1.20
243M27 Capillary Stopcock. Three-way. New type. **Each**	$3.00
243M28 Azotometer Unit. Consists of azotometer proper with certificate, leveling bulb, reading lens, rubber tubing, stand, and clamp. **Complete**	$29.65
243M29 Asbestos Shield. Mounted. **Each**	$1.50
243M30 Combustion Apparatus, Micro, Nitrogen, Dumas, Niederl. Complete as listed above—243M21 to 243M29, inclusive. For artificial gases of about 600 B. t. u.'s. **Each**	$106.20
243M31 Combustion Apparatus, Micro, Nitrogen, Dumas, Niederl. For natural gases. Otherwise, same as 243M30. **Each**	$106.20

Small sizes of standard forms of laboratory apparatus are to be found elsewhere in the catalog.

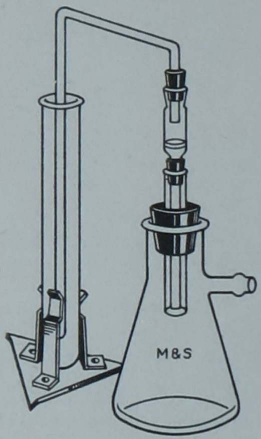
Micro Chemical Apparatus, Continued



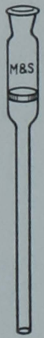
244M1

244M1 Combustion Tubes, Micro, Halogen and Sulphur, Pregl Page 95. Jena Supremax. With an enclosed solid glass spiral. **Each**..$3.50

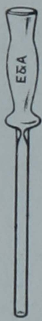
244M2 Contact Catalyzers, Micro, Platinum, Star, Pregl Second Edition. As employed in combustion tubes 244M1 in accordance with the method of Pregl. Prices on application.



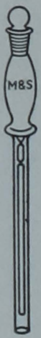
244M3



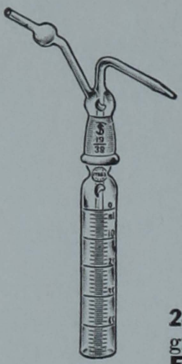
244M4



244M5



244M6

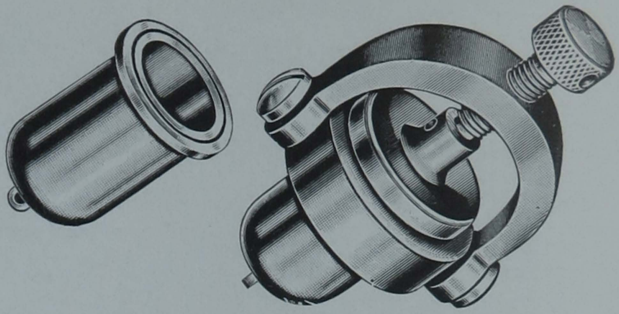


244M7

244M3 Filtration Apparatus, Micro, Halogen, Pregl Page 98. With fritted glass filter. As specified for filtration in determination of chlorine and bromide by the method of Pregl. **Each**..................................$5.20

244M4 Filter Tubes, Micro, Jena Fritted Glass, Pregl Page 97. Capacity, 1.5 ml. Diameter of disc, 12 mm. Porosity, Gl. **Each**..................................$3.30

244M5 Filter Tubes, Micro, Pregl Page 97. Numbered. With capillary constriction. **Each**..................$ .35



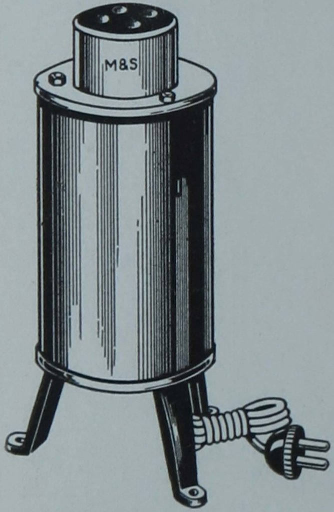
244M8

244M6 Filter Tubes, Micro, Pregl. Numbered. With ground glass stopper and two capillary constrictions. **Each**..$1.35

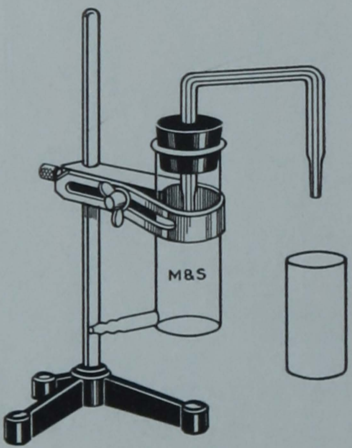
244M7 Bottles, Washing, Micro, Pyrex, Niederl Page 29. Graduated 0 to 50 in 1 ml. Capacity, 50 ml. Ŧ joint. **Each**..$2.75

244M8 Bombs, Micro, Parr, Niederl Page 125. For estimation of halogens, sulphur and phosphorous by peroxide fusion methods. Cup and cone machined from Illium with clamp mechanism of stainless steel. Complete with extra cup, six gaskets, bench socket, rod, dust cover and mahogany holder. **Each**..................................$35.00

244M9 Fusion Cup, Only. Of Illium. For 244M8. **Each**..$9.70



244M10

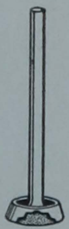


244M12

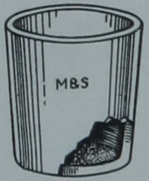
244M10 Furnaces, Micro, Carius, Electric. Vertical style for heating Carius tubes in determination of halogens and sulphur. Complete with rheostat and connecting cord and plug for 110 volts. **Each**........................$45.00

244M11 Combustion Tubes, Micro, Carius, Pyrex. For use in furnace 244M10. Diameter, 10 mm.; length, 200 mm. **Each**..$ .30

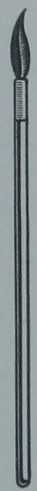
244M12 Filter Stands, Micro, Niederl Page 146. For the filter stick method of filtration. Complete as illustrated. Without filter stick. **Each**........................$5.15



244M13



244M15



244M16

244M13 Filter Sticks, Micro, Porcelain, Niederl Page 146. Porosity, about 7.5 microns. **Each**..................$3.60

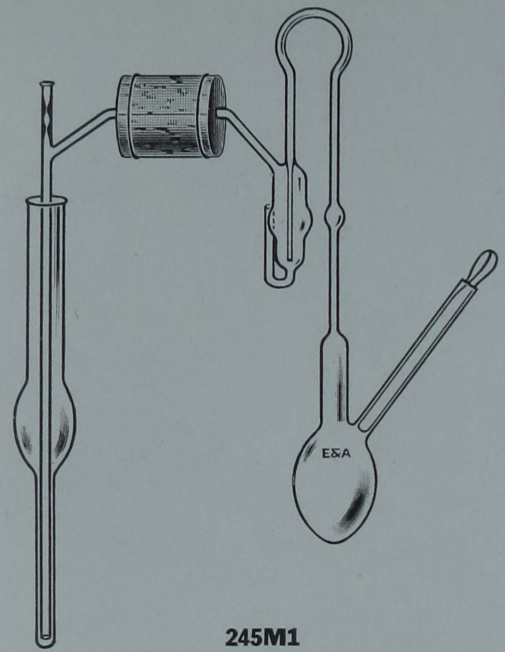
244M14 Crucibles, Filtering, Micro, Neubauer, Pregl Page 117. Platinum. Price on application.

244M15 Crucibles, Filtering, Micro, Neubauer. Porcelain. Capacity, 3 ml. **Each**..........................$1.00

244M16 Feathers, Transfer, Micro, Pregl Page 118. **Each**..$ .70

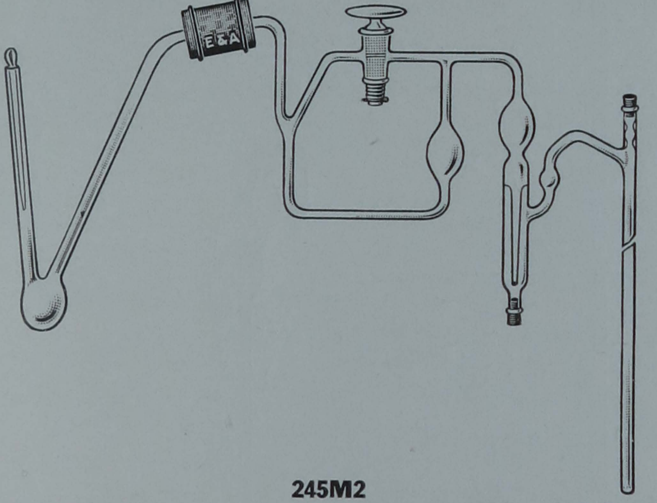
Small sizes of standard forms of laboratory apparatus are to be found elsewhere in the catalog.

Micro Chemical Apparatus, Continued



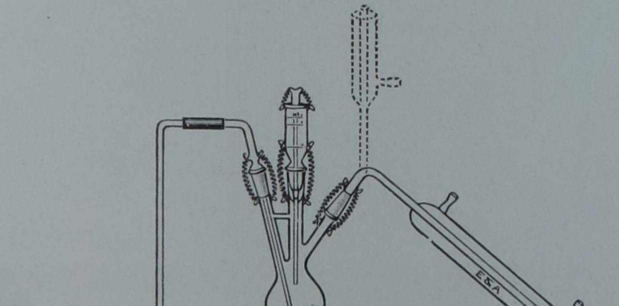
245M1

245M1 Methoxyl Ethoxyl Apparatus, Micro, Pregl Page 172, Pyrex. Complete as illustrated, with three receiving tubes. **Each**.................................**$9.00**



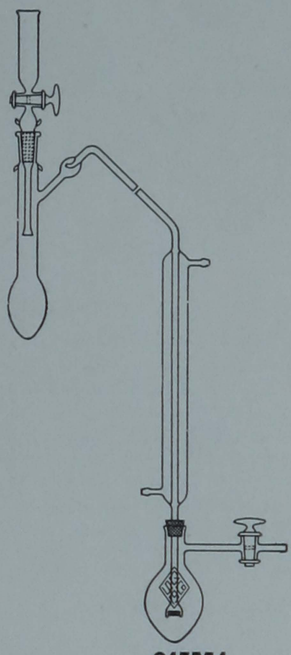
245M2

245M2 Methylimide Apparatus, Micro, Pregl Page 188, Friedrich. Complete as illustrated, with three receiving tubes. **Each**.................................**$12.00**

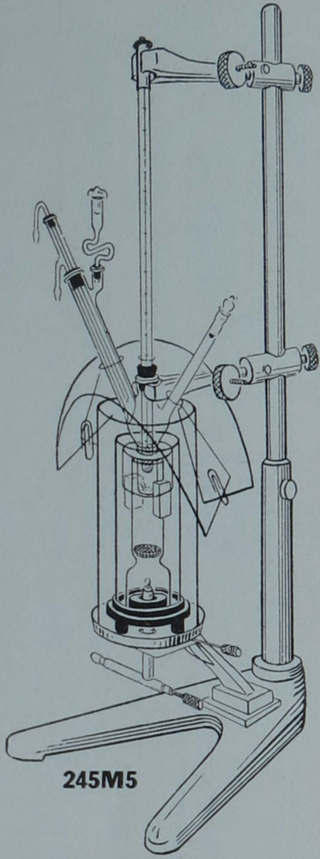


245M3

245M3 Acetyl Apparatus, Micro, Pyrex, Kuhn-Roth, Pregl Page 194. Complete as illustrated with rubber tubing connections and quartz condenser. **Each**...........**$45.50**



245M4

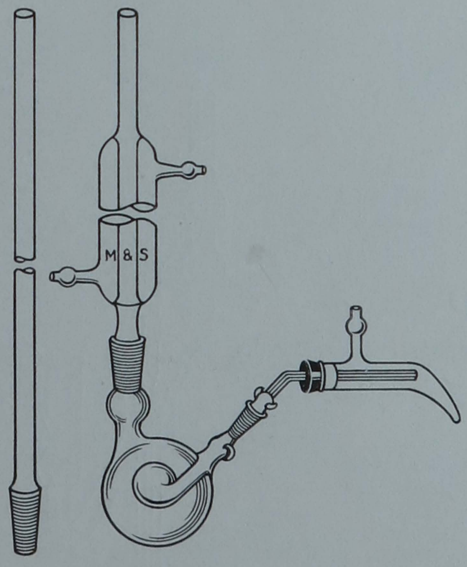


245M5

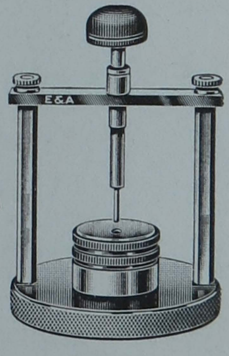
245M4 Acetyl Apparatus, Micro, Elek, Niederl Page 200. Complete as illustrated. **Each**.....................**$18.50**

245M5 Molecular Weight Apparatus, Micro, Beckman, Pregl Page 229. Complete as illustrated, with special micro Beckman differential thermometer and burner for natural gas. **Each**....................................**$54.00**

245M6 Thermometer, Only, Micro, Beckman. Range, 3° C. in intervals of $^{1}/_{100}$° C. Auxiliary scale range, –10° to 140° C. **Each**.....................................**$18.00**



245M7



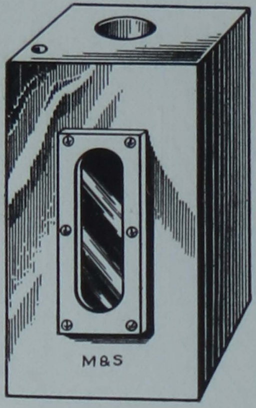
245M8

245M7 Molecular Weight Apparatus, Micro, Niederl Page 176. Complete as illustrated. **Each**...........**$25.00**

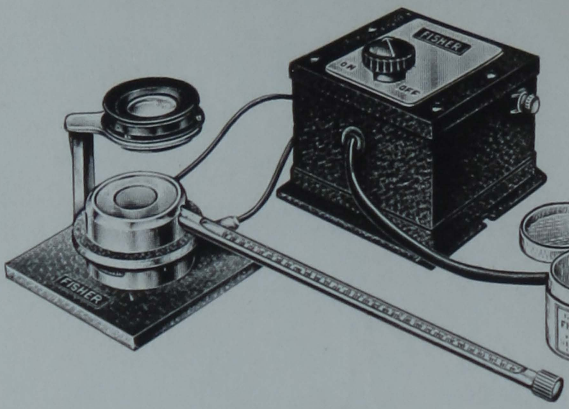
245M8 Pellet Presses, Micro, Pregl Page 232. Produces pellets with weights between 7 and 10 milligrams. **Each**...**$13.00**

Small sizes of standard forms of laboratory apparatus are to be found elsewhere in the catalog.

Micro Chemical Apparatus, Continued



246M1

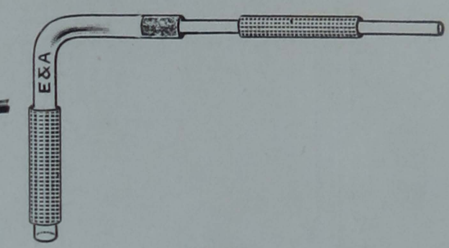


246M3

246M1 Boiling Point Apparatus, Micro, Schleiermacher, Pregl Page 226. As illustrated, with observation windows, but without burner or boiling point tubes. **Each** **$21.00**

246M2 Boiling Point Tubes. For 246M1. **Each** . . . . **$ .35**

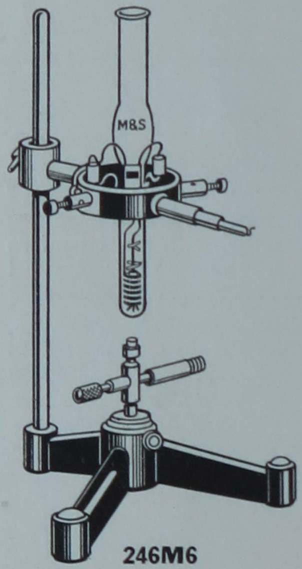
246M3 Melting Point Apparatus, Micro, Fisher. Samples are placed between cover glasses on an electrically heated aluminum stage. A magnifier above the sample makes it possible to see the actual point at which melting takes place. Also adaptable for use as a micro hot plate. Complete with thermometer, magnifier, box of cover glasses, transformer, cord and plug. For 110 volts. **Each** **$32.50**



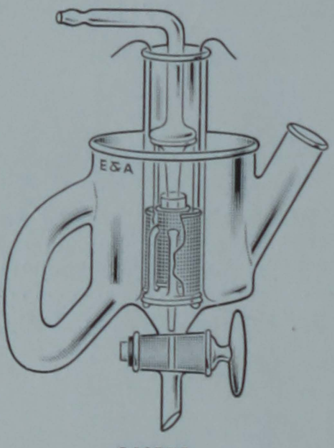
246M4

246M4 Muffles, Micro, Pregl Page 138. Supremax Glass. For metal in salt determinations. Complete as illustrated, with nichrome gauze rolls. **Each** **$3.00**

246M5 Cylinders, Platinum, Micro, Coombs-Alber. For use with 246M4. Made in the form of a cylinder with a flat side and with wire handle. Length of cylinder, 33 mm.; length of handle, 17 mm. Approximate weight, 0.45 gram. Price on application.



246M6



246M8

246M6 Electrolytic Cells, Micro, Pregl Page 142. As illustrated, except without electrodes. **Each** **$32.00**

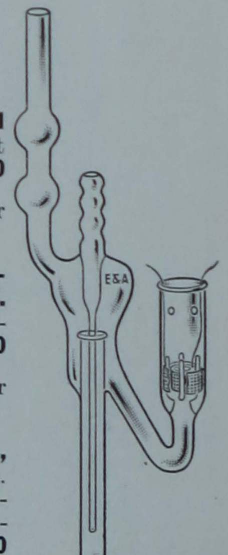
246M7 Platinum Electrodes. For 246M6. Price on application.

246M8 Electrolytic Cells, Micro, Clark-Hermance, Emich-Schneider Page 152. Complete as illustrated, but without electrodes. **Each** **$11.50**

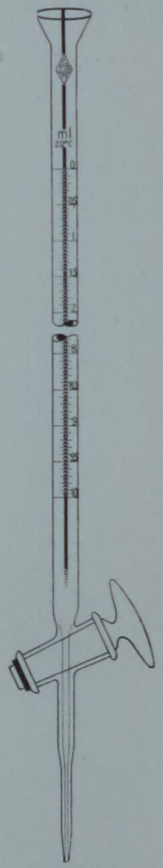
246M9 Platinum Electrodes. For 246M8 Price on application.

246M10 Electrolytic Cells, Micro, Clark-Hermance. J. Am. Chem. Soc. 54,877 (1932). For large volumes. Complete as illustrated, except without electrodes. **Each** **$7.50**

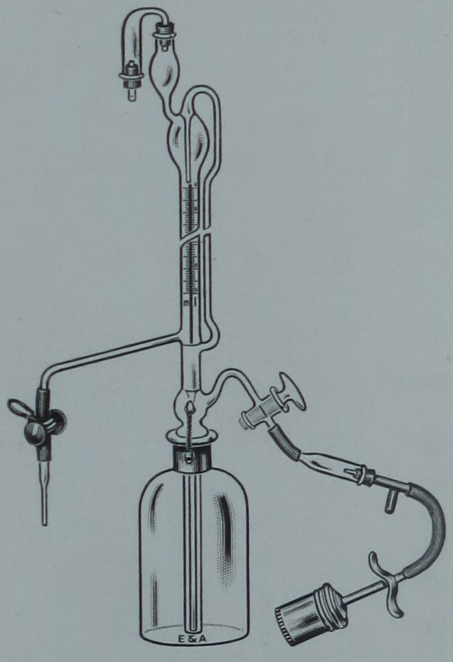
246M11 Platinum Electrodes. For 246M10. Same as 246M9. Price on application.



246M10



246M12



246M13

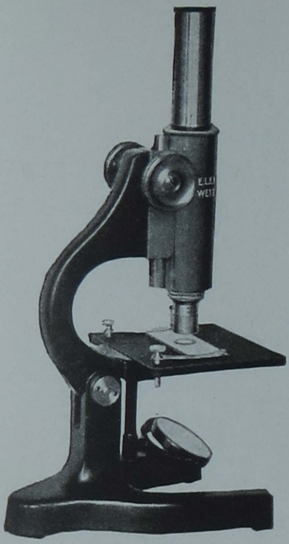
246M12 Burettes, Micro, Schellbach, Oblique Stopcock. With funnel top, and long delivery tip with fine capillary bore. Capacity, 10 ml. in $\frac{1}{20}$ ml. **Each** **$3.40**

246M13 Burettes, Micro, Automatic, Schellbach, Pregl. Complete as illustrated, with burette equipped with automatic level adjusting tube, pinchcock, overflow bulb, and 1000 ml. reservoir. **Each** **$14.50**

246M14 Burettes, Micro, Automatic, Schellbach, Pregl. Same as 246M13, except with delivery through glass stopcock. **Each** **$16.00**

Small sizes of standard forms of laboratory apparatus are to be found elsewhere in the catalog.

Microscopes, Leitz



247M1

247M1 Microscopes, Leitz Model 0. Recommended for elementary studies in biological laboratories where a magnification up to 500X is required. It serves excellently for high school and elementary biological studies. The microscope is of standard size but has no micrometer fine adjustment. The rack and pinion coarse adjustment is accurate; offering quick and convenient adjustment and is built to withstand hard usage. It serves for fine as well as coarse adjustment.

Body Tube: Stationary type, diameter, 30 mm., with fixed draw tube.

Base, Pillar and Arm: The base is of modified horseshoe form, broad and stable. The pillar is of one-piece construction. The base contains a double inclination joint and friction device to hold stand at any desired angle. A heavy curved arm provides ample space for large specimens.

Focusing Adjustment: Consists of a diagonal rack and pinion. Large bearing surfaces are provided for smooth operation. (No fine adjustment provided for in this microscope.)

Stage: Rectangular 90x100 mm., provides a distance of 80 mm. from optical center to arm, furnished with stage clips. Will resist the action of laboratory chemicals and reagents.

Substage: Rotating disc diaphragm with multiple circular openings provides varying intensity of illumination.

Mirror: Plano-concave, 40 mm. diameter, mounted to an adjustable bracket.

Finish: Black enamel, with chromium plated parts, corrosion resistant.

Case: Hardwood, highly polished, with lock and key. Complete with triple divisible objective and Huyghens eyepiece 12X, offering magnifications of 100-500X. In case. **Each** **$48.50**

247M2 Microscope Stands, Only. For 247M1 microscopes. With substage; without objectives or eyepieces. In case. **Each** **28.00**

247M3 Objectives. Triple Divisible. 8.5-22-42X. (18.7-8-4.3 mm.). **Each** **$17.50**

247M4 Eyepieces. Huyghens. 12X. **Each** .... **$ 3.00**
Note: If microscope is desired without case, deduct $1.75.

Microscopes, Leitz Model H. Constructed to meet the requirements of biology classes, especially so for those schools where a reasonably priced microscope is desired. Recommended for all classroom studies where an instrument is desired for magnification not in excess of 500X. The standard Leitz objectives and eyepieces such as are furnished on the higher priced microscopes are the identical type supplied with this microscope.

Body Tube: Is of 35 mm. diameter; stationary pattern. (If desired, adjustable draw tube will be furnished without charge.)

Base, Pillar and Arm: The base is of modified horseshoe form. The pillar has a double joint and friction device to hold stand at any desired angle while stops are provided for horizontal and vertical positions. The arm is of heavy curved form providing ample space for large specimens.

Focusing Adjustment: Coarse adjustment is by rack and pinion. The fine adjustment consists of a sensitive and precise but extremely rugged micrometer screw to withstand rough handling.

Stage: Metal, completely covered with vulcanite; measures 114x114 mm.; provided with stage clips.

Substage: Rotating disc diaphragm with multiple circular openings, attached to the under surface of the microscope stage, provides varying intensity of illumination.

Mirror: Plano-concave, 50 mm. diameter, mounted to an adjustable bracket.

Finish: Black enamel with chromium plated parts.

Case: Hardwood, highly polished, with lock and key.

Number	Model	Achromatic Objectives	Huyghens Eyepieces	Combined Magn.	**Each**
247M5	H-2a	10X* (16mm.) 45X (4mm.)	10X	45X-450X	**$70.00**
247M6	H-4	10X* (16mm.) 45X (4mm.)	6X-10X	27X-450X	**$73.00**

*Objective of divisible type. By unscrewing the front lens, the remaining unit offers a varying magnification.

Microscopes 247M5 and 247M6 are furnished with revolving double dustproof nosepiece.

247M7 Microscope Stands, Only. For 247M5 and 247M6 microscopes. With substage; without nosepiece, objectives or eyepieces. In case. **Each** **$33.50**

247M8 Objectives. Achromatic. 10X (16mm.) **Each** .... **$ 9.50**

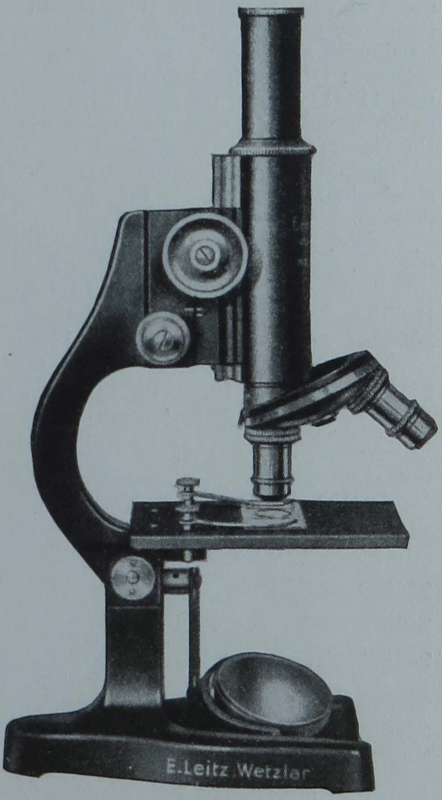
247M9 Objectives. Achromatic. 45X (4mm.) **Each** **$17.00**

247M10 Eyepieces. Huyghens. 6X **Each** .... **$ 3.00**

247M11 Eyepieces. Huyghens. 10X. **Each** .... **$ 3.00**

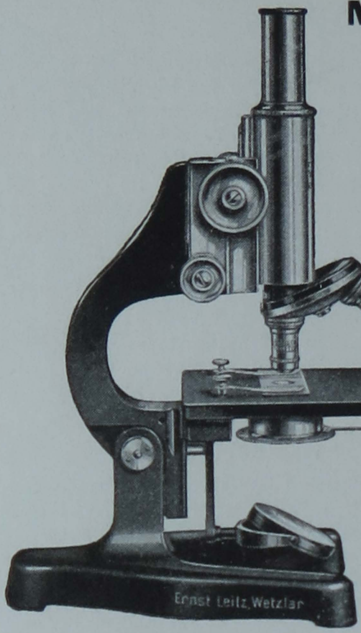
247M12 Nosepieces. Revolving; double dustproof. **Each** .... **$ 7.00**

Note: If microscope is desired without case, or objective boxes, deduct $3.50 for the case and $ .35 for each objective box.



247M5

Microscopes, Leitz, Continued



248M1

Microscopes, Leitz, Model LL. Used extensively by schools, colleges and laboratories. Stand is of full size. The instrument is well built and will withstand years of hard usage.

Body Tube: Is of 35 mm. diameter; stationary pattern. (If desired, adjustable draw tube will be furnished without charge.)

Base, Pillar and Arm: The base is of modified horseshoe form. The pillar has a double joint and friction device to hold stand at any desired angle while stops are provided for horizontal and vertical positions. Heavy curved arm provides ample space for large specimens.

Focusing Adjustment: Coarse adjustment is by rack and pinion. The fine adjustment consists of a sensitive and precise but extremely rugged micrometer screw to withstand rough handling. One micrometer head is equipped with divided drum with vernier which records the lateral displacement of the microscope tube within 0.004 mm. and consesequently permits accurate measurements of the thickness of specimens.

Stage: Of metal, completely covered with vulcanite; measures 114x114 mm.; provided with stage clips. The sleeve beneath the stage carries a cylinder iris diaphragm situated in the plane of the stage.

Substage: In withdrawing the cylinder iris diaphragm, the stage sleeve is available for the insertion of substage condensers.

Finish: Black enamel with chromium plated parts.

Case: Hardwood, highly polished, with lock and key.

Number	Model	Achromatic Objectives	Huyghens Eyepieces	Combined Magn.	Each
248M1	LL-2a	10X* (16mm) 45X (4mm.)	10X	45-450X	**$83.00**
248M2	LL-4	10X* (16mm) 45X (4mm)	6X-10X	27-450X	**$86.00**

Microscopes 248M1 and 248M2 are furnished with revolving dustproof double nosepieces.

*Objective of divisible type.

248M3 Microscope Stands, Only. For 248M1 and 248M2 microscopes. In case. **Each** **$46.50**

248M4 Objectives. Achromatic. 10X (16mm). **Each $ 9.00**

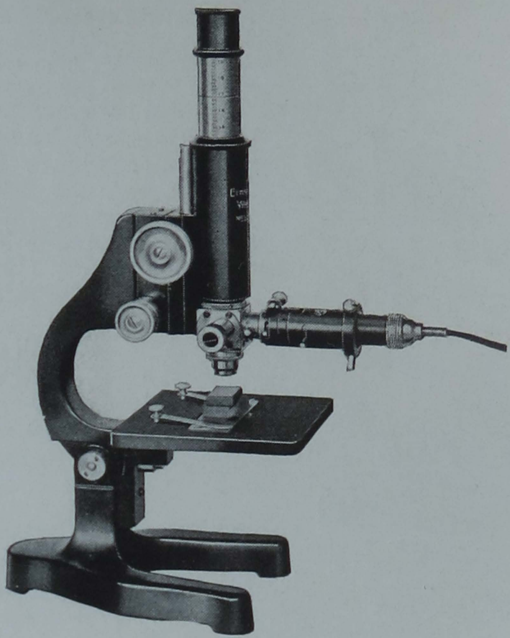
248M5 Objectives. Achromatic. 45X (4mm). **Each, $17.00**

248M6 Eyepieces. Huyghens. 6X. **Each** **$3.00**

248M7 Eyepieces. Huyghens. 10X. **Each** **$3.00**

248M8 Nosepieces. Revolving, double, dustproof. **Each** **$7.50**

Note: If microscope is desired without case or objective boxes, deduct $3.50 for case and $ .35 for each objective box.



248M9

248M9 Microscopes, Leitz Simplified Metallurgical Model LL. Recommended for the examination of metals and alloys, rough castings, fractures, etc. It is intended for laboratories where an inexpensive yet efficient instrument is desired.

Body Tube. Standard size.

Base, Pillar and Arm. Curved horseshoe base built with inclination joint.

Focusing Adjustment: Coarse focusing by rack and pinion; fine focusing by precision micrometer screw, one head of the micrometer is supplied with divided drum and vernier for measuring purposes to within 0.004 mm.

Stage: Of metal, covered with vulcanite with removable ring plate to close opening in center of stage.

Vertical Illuminator: Large type, equipped with objective clutch by means of which objectives are held in place and easily interchanged. A total reflecting prism and glass plate are simultaneously mounted to a bar which when fully inserted, places the total reflecting prism within the optical rays. The illuminator is equipped with a condenser lens and iris diaphragm.

Finish: Black enamel, with chromium plated parts.

Case: Hardwood, with lock and key.

Complete, with substage and vertical illuminator but without objectives, eyepieces or 248M12 lamp attachment pictured. **Each** **$84.00**

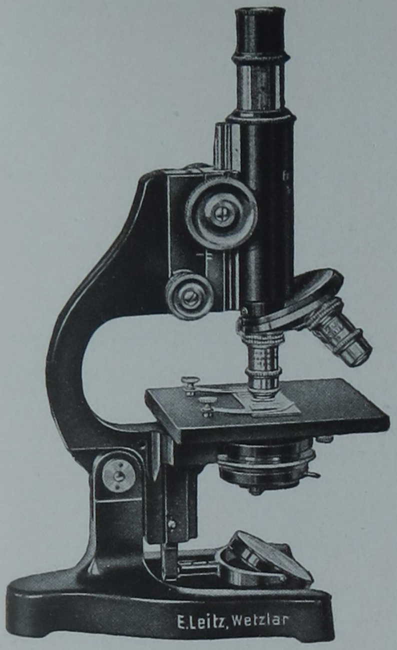
248M10 Microscopes, Model LL-A. Same as 248M9, except includes achromatic objectives 5.5X (32mm) and 12X (16mm), dry (in short mounts) as well as Huyghens eyepieces 6X and 10X. **Each** **$107.00**

248M11 Microscopes, Model LL-B. Same as 248M9, except includes achromatic objectives 5.5X (32mm). and 49 (4mm), dry (in short mounts) as well as Huyghens eyepieces 6X, 10X and 12X. **Each** **$128.75**

248M12 Microscope Lamp Attachments. With aperture diaphragm, for clamping to large vertical illuminator, equipped with a low voltage bulb 8-volt., 0.6 amperes, one each daylight and contrast filter and additional replacement bulb, cord and plug. **Each** **$32.00**

248M13 Transformers. 110-volt, A. C. **Each** **$6.00**

Microscopes, Leitz, Continued



249M1

Microscopes, Leitz Model L-10. One of the most popular types for routine investigations in hospital laboratories, medical schools and for general practitioners. The stand is substantial and well built, being constructed to withstand hard usage.

Body Tube: Is of 35 mm. diameter. It is provided with draw tube for standard eyepieces, the draw tube being graduated in single millimeters, every tenth line numbered.

Base, Pillar and Arm: The base is of modified horseshoe form. The pillar has a double joint and friction device to hold stand at any desired angle while stops are provided for horizontal and vertical positions. The arm is of heavy curved form, providing ample space for large specimens.

Stage: Of metal, completely covered with vulcanite; measures 114x114 mm.; provided with stage clips.

Substage: Rack and pinion, with two-lens condenser N. A. 1.20, with iris diaphragm and holder for blue and ground glass filters.

Finish: Black enamel with chromium plated parts.

Case: Hardwood, highly polished, with lock and key.

Microscope is furnished with revolving, triple, dustproof nosepiece.

Number	Model	Achromatic Objectives	Huyghens Eyepieces	Combined Magn.	**Each**
249M1	L-10	10X* (16mm) 45X (4mm) Oil immersion 90X (1.8mm) N. A. 1.25	6X-10X	27X-900X	**$135.00**

*Objective of divisible type.

249M2 Microscope Stands, Only. For 249M1 microscopes. With substage; without nosepiece, objectives or eyepieces. In case. **Each** **$59.00**

249M3 Objectives, Achromatic. 10 X (16mm). **Each** .... **$ 9.00**

249M4 Objectives. Achromatic. 45X (4 mm). **Each** **$17.00**

249M5 Objectives. Achromatic Oil Immersion. 90X (1.8mm). N. A. 1.25. **Each** **$35.00**

249M6 Eyepieces. Huyghens. 6X. **Each** .... **$ 3.00**

249M7 Eyepieces. Huyghens. 10X. **Each** .... **$ 3.00**

249M8 Nosepieces. Revolving, triple, dustproof. **Each** **$9.00**
Note: If microscope is desired without case or objective boxes, deduct $3.50 for case and $ .35 for each objective box.

Microscopes, Leitz Model LS-10. Recommended for physicians and medical students. It is preferred for the reason that it is supplied with a mechanical stage in order that a particular portion of any slide may be readily located. At a time when it is necessary to use the microscope without mechanical stage, especially when examining "Petri" dish cultures or large sections, the mechanical stage can very conveniently be racked off, leaving the microscopes available with a plain flat stage. The mechanical motion of the stage permits complete coverage of a 75x50 mm. slide. The mechanical motion of the stage prevails by means of two racks and pinions, the controls of which are permanently located in such positions as to retain their relative position to each other at all times. In all other respects this microscope is the same as 249M1. Furnished with revolving, triple, dustproof nosepiece.

Number	Model	Achromatic Objectives	Huyghens Eyepieces	Combined Magn.	**Each**
249M9	LS-10	10X* (16mm) oil immersion 90X (1.8mm) N. A. 1.25	6X-10X	27X-900X	**$155.00**

*Objective of divisible type.

249M10 Microscope Stands, Only. For 249M9 microscope. With substage; without nosepiece, objectives, or eyepieces. In case. **Each** **$79.00**

249M11 Objectives. Achromatic. 10X (16mm). **Each** .... **$ 9.00**

249M12 Objectives. Achromatic. 45X (4mm). **Each** **$17.00**

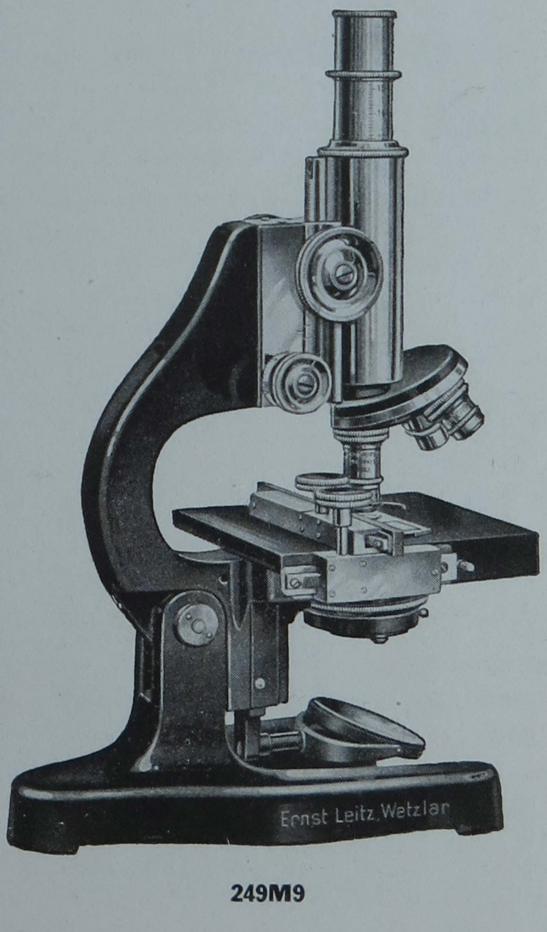
249M13 Objectives. Achromatic Oil Immersion. 90X (1.8 mm. N. A. 1.25). **Each** **$35.00**

249M14 Eyepieces. Huyghens. 6X. **Each** .... **$ 3.00**

249M15 Eyepieces. Huyghens. 10X. **Each** .... **$ 3.00**

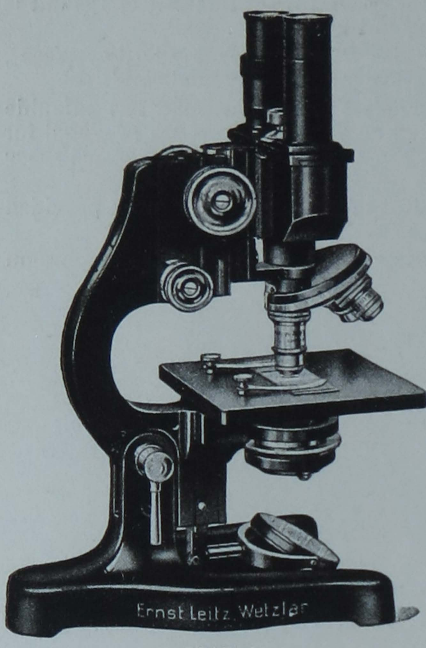
249M16 Nosepieces. Revolving, triple, dustproof. **Each** .... **$ 9.00**

Note: If microscope is desired without case, or objective boxes, deduct $3.50 for case and $ .35 for each objective box.



249M9

Microscopes, Leitz, Continued



250M1

Microscopes, Leitz Model LMB-10a. The binocular microscope affords relaxation and freedom from eyestrain through the use of parallel tubes. Independent focusing of the left eyepiece tube corrects any inequality of vision. Particularly suitable for work which demands the use of the microscope for an extended period.

A monocular tube is available for easy interchange with the binocular body, permitting the conversion of the binocular to a monocular microscope.

An inclined monocular eyepiece tube enables one to use the monocular construction while assuming a natural sitting position. It is convenient for blood counts and examination of liquid specimens.

Binocular Body Tube: Consists of housing containing a prism system, provided with two parallel ocular tubes for the accommodation of paired eyepieces; tubes are fitted to a slider permitting the adjustment of interpupillary distance and a scale for reading it is supplied. One ocular tube is furnished with spiral screw to correct against difference in vision between eyes of observer.

Monocular Body Tube: Of standard size with draw tube graduated in millimeters. (Not furnished with instrument but to be ordered separately.)

Base, Pillar and Arm: The base is of modified horseshoe type; pillar, with double joint and clamping lever to hold stand in any desired angle; arm, heavy curved, provides ample space for large specimens.

Focusing Adjustment: Coarse adjustment by rack and pinion; fine adjustment, new type, ball-bearing, offering accurate performance of fine adjustment and measuring to within an accuracy of 2 microns. One micrometer head, equipped with divided drum and vernier.

Stage: Plain square stage measures 114x114 mm.; of metal, completely covered with vulcanite; provided with stage clips.

Substage: Rack and pinion, with two-lens condenser N. A. 1.20, with iris diaphragm and holder for blue and ground glass filters.

Finish: Black enamel with chromium plated parts.

Case: Hardwood, highly polished, with lock and key.

Furnished with revolving, triple, dustproof nosepiece.

Number	Model	Achromatic Objectives	Paired Huyghens Eyepieces	Combined Magn.	**Each**
250M1	LMB-10a	10X* (16mm) 45X (4mm) Oil immersion 90X (1.8mm) N. A. 1.25	6X-10X	27X-900X	**$215.00**

*Objective of divisible type.

250M2 Microscopes, Leitz Model LMBS-10a. Same as 250M1 (Model LMB-10a), but furnished with a built-on mechanical stage, without scales or verniers. The stage has sufficient range of motion to cover completely a 75x25 mm. slide. The mechanical stage can easily be removed when there are large slides or Petri dishes to be examined. **Each** **$235.00**

250M3 Monocular Tubes. For 250M1 or 250M2 microscopes. **Each** **$10.00**

250M4 Eyepiece Tubes, Inclined Monocular. For use with 250M3 monocular tube as additional equipment. **Each** **$20.00**

250M5 Prism Bodies, Inclined Binocular. When furnished in place of upright prism body, permits retaining natural position and eliminates fatigue. Additional, **Each** **$20.00**

250M6 Microscope Stands, Binocular, Only. For 250M1 microscopes With prism body and substage; without nosepiece, objectives or eyepieces. In case. **Each** **$133.00**

250M7 Microscope Stands, Binocular, Only. For 250M2 microscopes. With prism body and substage; without nosepiece, objectives or eyepieces. In case. **Each** **$153.00**

250M8 Objectives. Achromatic. 10X (16mm). **Each** .... **$ 9.00**

250M9 Objectives. Achromatic. 45X (4mm). **Each** **$17.00**

250M10 Eyepieces. Paired Huyghens. 6X. **Pair** .... **$ 6.00**

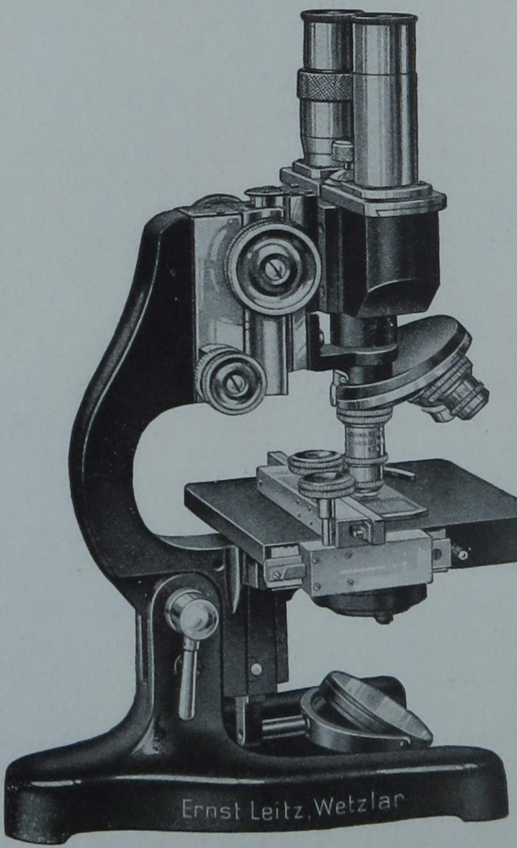
250M11 Eyepieces. Paired Huyghens. 10X. **Pair** .... **$ 6.00**

250M12 Nosepieces. Revolving, triple, dustproof. **Each** ...... **$ 9.00**

250M13 Vertical Body Tubes, Binocular. Without eyepieces. **Each** **$70.00**

Note: If microscopes are desired as monocular (without binocular body), single additional eyepieces are to be ordered (not paired eyepieces).

Note: If microscope is desired without case, or objective boxes, deduct $3.50 for case; and $ .35 for each objective box.



250M2

Microscopes, Leitz, Continued

Microscopes, Model AMB-T and AMBI-T. For research investigations and routine laboratory studies. A square built-in mechanical stage (2 stages in one) controlled by worm screw and rack and pinion, covers a range of 31x51 mm., respectively. Movement of the mechanical stage is provided with scales and verniers divided into millimeters to facilitate orientation of specimen. They are equipped in each instance with an aplanatic-achromatic condenser, ball-bearing fine adjustment and complete substage for examination by oblique illumination.

Binocular Body Tube: Model AMB-T is supplied with a vertical prism body, consisting of a housing containing a prism system, provided with two parallel ocular tubes for the accommodation of paired eyepieces; tubes are fitted to a slider permitting the adjustment of interpupillary distance, and scale for reading it is supplied. One ocular tube is furnished with spiral screw to correct against difference in vision between eyes of observer.

Note: Model AMBI-T is supplied with an inclined prism body. In all other respects, Model AMBI-T is identical to Model AMB-T.

Monocular Body Tube: 50 mm. diameter; furnished in addition to the binocular body tube. (See note at bottom of page.)

Base, Pillar and Arm: The base is of extra large modified form. The pillar has a double joint and clamping lever to hold the stand in any desired angle, while stops are provided for horizontal and vertical position. The arm is of heavy curved form providing ample space for large specimens.

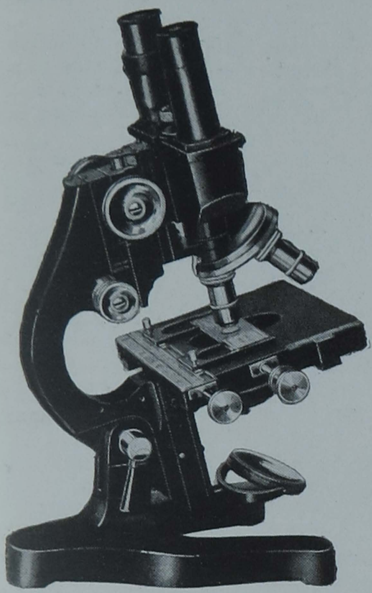
Nosepiece Adapter: Maintains objectives in permanently centered position.

Focusing Adjustment: Coarse adjustment by rack and pinion. The new ball-bearing micrometer screw serves as fine adjustment; a safety device being provided to prevent injury to specimens and objectives. A divided micrometer head with vernier records the lateral displacement of the microscope tube within 0.001 mm. and consequently permits measurements of the thickness of specimens.

Stage. Combination built-in mechanical stage 120x120 mm.; of metal completely covered with vulcanite.

Substage: By vertical rack and pinion, permitting the illuminating rays to be focused in an axial direction. Plano and concave mirror of 50 mm. diameter above which is mounted a carrier supplied with iris diaphragm provided with rack and pinion movement for oblique illumination; the iris diaphragm can be swung to one side. Centering adapter into which is fitted an aplanatic-achromatic condenser N. A. 1.40 supplied with white ground and blue ground filters.

Finish: Black enamel with chromium plated parts. Case: mahogany wood, highly polished, with lock and key.


251M1

		Objectives		Paired	Combined	
Number	Model	Dry	Oil Immersion	Eyepieces	Magn.	**Each**
251M1**	AMBT-13	Achromat 3.2X (24mm)		Huyghens		**$377.00**
251M2**	AMBIT-13	Achromat 10X*(16mm)	Achromat 90X (1.8mm)	5X 8X	16X-1440X	**397.00**
		Achromat 45X (4mm)	N. A. 1.25	12X 16X		
251M3**	AMBT-22	Achromat 3.2X (24mm)		Huyghens		**415.00**
251M4**	AMBIT-22	Achromat 10X*(16mm)	Fluorite 95X (1.95mm)	5X 8X	16X-1520X	**435.00**
		Fluorite 42X (4.2mm)	N. A. 1.32	12X 16X		
251M5***	AMBT-30a	Apochromat 12X (16mm)	Apochromat 92X (2mm)	Periplan	95X-1380X	**499.50**
251M6***	AMBIT-30a	Apochromat 46X (4mm)	N. A. 1.32	8X 15X		**519.50**

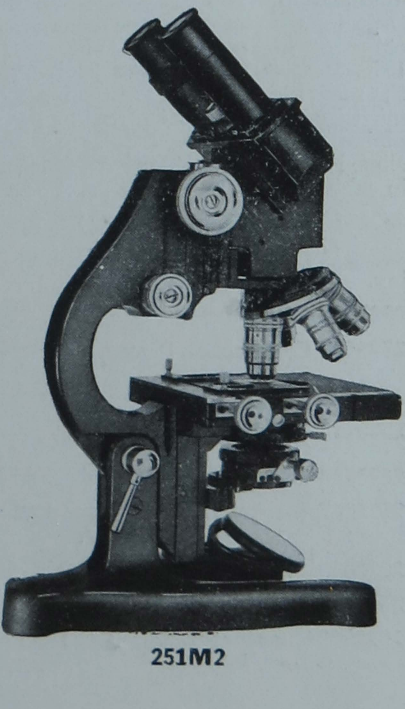
*Objective of divisible type. **With revolving, quadruple, dustproof nosepiece. ***With revolving, triple, dustproof nosepiece.

251M7 Binocular Microscope Stands, Only. For model AMB-T, with prism body monocular body tube, built-in mechanical stage, nosepiece adapter and substage; without nosepiece objectives or eyepieces. In case. **Each**......................**$272.00**

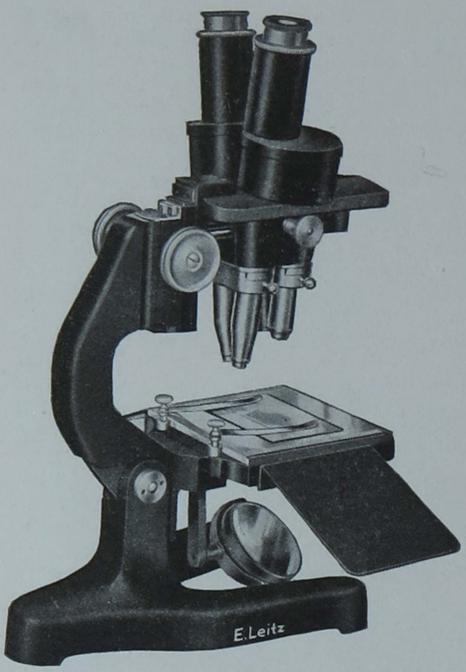
251M8 Objectives, Achromatic, 3.2X (24mm). **Each**	**$ 6.00**
251M9 Objectives. Achromatic, 10X (16mm). **Each**	**$ 9.00**
251M10 Objectives. Achromatic, 45X (4mm). **Each**	**$17.00**
251M11 Objectives. Achromatic, Oil Immersion 90X (1.8mm) N. A. 1.25. **Each**	**$35.00**
251M12 Objectives. Fluorite, 42X (4.2mm) Dry. **Each**	**$32.00**
251M13 Objectives. Fluorite Oil Immersion, 95X (1.95mm) N. A. 1.32. **Each**	**$58.00**
251M14 Objectives. Apochromatic, 12X (16mm) Dry. **Each**	**$32.50**
251M15 Objectives. Apochromatic, 46X (4mm) Dry. **Each**	**$65.00**
251M16 Objectives. Apochromatic, Oil Immersion 92X (2mm) N. A. 1.32. **Each**	**$86.00**
251M17 Eyepieces. Paired Huyghens, 5X. **Pair**	**$ 6.00**
251M18 Eyepieces. Paired Huyghens, 8X. **Pair**	**$ 6.00**
251M19 Eyepieces. Paired Huyghens, 12X. **Pair**	**$ 6.00**
251M20 Eyepieces. Paired Huyghens, 16X. **Pair**	**$ 9.00**
251M21 Eyepieces. Paired Periplan, 8X. **Pair**	**$14.50**
251M22 Eyepieces. Paired Periplan, 15X. **Pair**	**$20.50**
251M23 Nosepieces. Revolving, Triple, Dustproof. **Each**	**$ 9.00**
251M24 Nosepieces. Revolving, Quadruple, Dustproof. **Each**	**$11.00**
251M25 Binocular Body Tubes, Vertical. Without eyepieces. **Each**	**$70.00**
251M26 Binocular Body Tubes, Inclined. Without eyepieces. **Each**	**$90.00**

If Monocular Body Tube is not desired, deduct $10.00.

If microscope is desired without case, or objective boxes, deduct $5.50 for the case, $ .35 for each objective box.


251M2

Microscopes, Leitz, Continued



252M1

252M1 Microscopes, Leitz, Wide Field Binocular Model BI-Ma. Serves in practically every field of scientific endeavor covering biology, geology, metallurgy, testing, industrial and commercial laboratories. An important innovation is offered in the new improved Leitz multiple nosepiece by means of which a quick interchange of objectives is accomplished.

The stand model resembles the standard type of microscope and is of heavy construction. The foot measures from tip to heel 200 mm., and the distance from the inside surface of the handle arm to the front edge of the stage is 160 mm. Owing to this distance, the stage will accommodate conveniently specimens of very large size. The stage consists of a metal frame and carries a beveled glass plate 100x100 mm. A groove below the stage accommodates a ground glass plate to create diffused light, or interchangeable with it another plate with one surface white, the other black. (Both plates are included). Two stage clips are provided. Detachable hand rests, one on each side, are supplied. A large mirror, one surface plane, the other concave, is attached to the lower surface of the stage by universal joint and serves to illuminate the specimens adequately in transmitted light. The stand is finished in black lacquer and is alcohol and reagent-proof.

The binocular body is provided with an automatic objective changer and has provisions for accommodating two additional pairs of objectives, besides the 1X, which are permanently mounted in the binocular body. Thus the microscope can be equipped at all times with three pairs of objectives.

The focusing mechanism consists of double slider with rack and pinion, one side of which fits into the standard and the other receives the binocular body.

Complete with stand model BI-Ma, including handle arm, baseplate and arm rests; binocular body, with objective changer and built-in pair of permanently mounted objectives 1X (62 mm.); focusing mechanism, with objectives 2X (55 mm.) and 3X (46 mm.); two pairs of eyepieces, 8X and 18X, offering a varied range of magnification from 8 to 54X; and multiple objective nosepiece. In cabinet, with lock and key. **Each** $198.00

252M2 Binocular Stands, Only. Model BI-Ma, including handle, arm rests, and baseplate in case. **Each** $31.00

252M3 Focusing Mechanism. Each $15.00

252M4 Binocular Bodies. With multiple objective nosepiece with permanently mounted pair of objectives 1X (62 mm.). **Each** $89.00

252M5 Objectives. 2X (55 mm.). **Pair** $19.00

252M6 Objectives. 3X (46 mm.). **Pair** $19.00

252M7 Eyepieces. 8X. **Pair** $12.50

252M8 Eyepieces. 18X. **Pair** $12.50

Note: If binocular body is desired with inclined ocular tubes (in place of vertical) add $20.00.
Note: If microscope is desired without case, deduct $4.00.

252M9 Microscopes, Leitz, Ore Dressing. The construction of the stand utilizes two rack and pinion motions, whereas the object stage has a large opening which can be closed by the metal plate or in which a trough can be inserted. The latter, intended to simplify the counting of grains, is divided into square centimeters. To assure perfect illumination, the back of the large illuminating mirror is furnished with opal glass disc. Object stage and mirror are removable for studying large specimens. For investigation of ore dressing products and raw ores, optics are desired offering magnifications of 12.5X, 18X, 25X, 36X, 50X, and 72X. These magnifications are arrived at by multiplying the magnification of the objective by the eyepiece. This microscope has a cross movement by rack and pinion motion on ball bearings, interchangeable slide with rack and pinion motion, removable stage with large opening, closing by a metal plate, 2 stage clips, large removable mirror and interchangeable stereoscopic double tube (Greenough), in cabinet. **Each** $198.00

252M10 Set of Micrometer Plates. 6 plates in mount. **Set** . . . . $ 28.00

252M11 Glass Plates. With ruling (trough) in mount, for insertion in the stage opening. **Each** . . . . $ 4.50

252M12 Objectives. Paired, 1X. **Pair** . . . . $ 19.00

252M13 Eyepieces. Paired, G 12.5X. One eyepiece has a focusing eye-lens. **Pair** . . . . $ 12.50

252M14 Outfits. For magnifications 12.5X. **Each** $262.00

252M15 Additional Equipment. For magnifications 18X to 72X . . . . $ 56.00

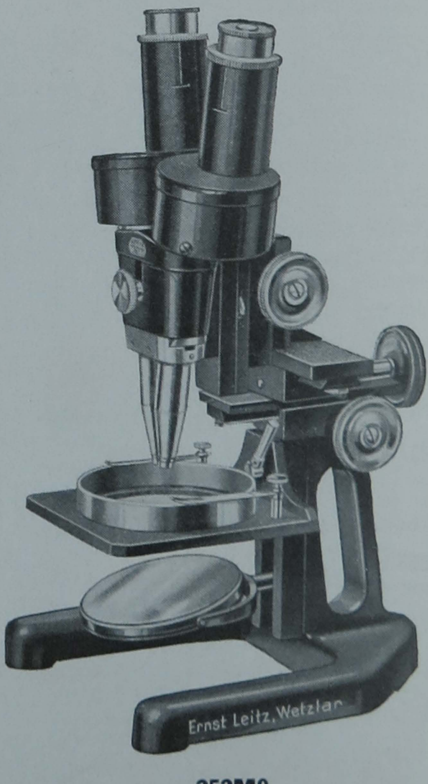
252M16 Outfits 252M14 and 252M15. For magnifications 12.5X to 72X.. . . . $318.00

252M17 Removable Intermediate Piece. For paired objectives 2X and upwards. **Each** . . . . $ 5.50

252M18 Objectives. Paired, 2X. **Pair** . . . . $ 19.00

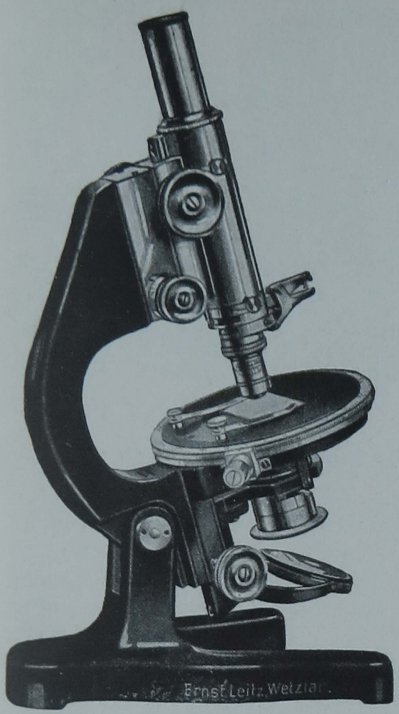
252M19 Objectives. Paired, 4X. **Pair** . . . . $ 19.00

252M20 Eyepieces. Paired, G 18X. One eyepiece has a focusing eye-lens. **Each** $ 12.50



252M9

Microscopes, Leitz, Continued



253M1

253M1 Microscopes, Leitz Polarizing Model III M-40. Recommended for the examination of mineral specimens, metals, and ores; for the investigations of slags; for use in the field of chemical microscopy and routine laboratory investigations.

Microscope Stand: Standard size with tube for eyepieces of normal diameter. Furnished with a large handle arm to accommodate the Leitz universal rotating stage, Model UT-4.

Object Stage: 120 mm. diameter, rotatable, with clamp for arresting the rotation; supplied with scale and index mark, including two stage clips and one spring clip.

Micrometer Screw: With divided drum for vernier reading to 0.002 mm.

Coarse Adjustment: By rack and pinion.

Tube Analyzer. With compensation lens.

Lens, Amici-Bertrand: In permanent mount, attached to slider.

Tube Slit: Arranged at 45° for the insertion of compensators.

Objective Clutch Changer:* Retains objectives individually and permanently centered.

Objective Adapters: Three are included.

Ocular-Diaphragm.

Illuminating Apparatus: With polarizer prism and three-lens condenser, permanently attached to polarizer.

Case: Hardwood, highly polished, with lock and key.

Complete with achromatic objectives, 10X (16mm.) and 45X (4 mm.), free from polarization; Huyghens eyepieces, 5X and 8X, with adjustable eyelens and crosswebs; Selenite plate red 1st order, in mounting; mica plate, ¼ und., in mounting; quartz wedge 1-4 order, in mounting. In case. **Each**....................**$350.75**

*In place of this clutch, a revolving nosepiece, with centering device may be supplied. This nosepiece has the advantage that the objectives remain on the microscope. If a nosepiece is supplied in place of the clutch, deduct $2.50 for the triple nosepiece and add $3.50 for the quadruple nosepiece.

Note: For Model UT-4 Leitz universal rotating stage, information and prices on request.

253M2 Top Analyzer (Cap Nicol). With flange, graduated in millimeters. **Each**..**$29.00**

253M3 Supporting Flange. For cap nicol. **Each**....................**$ 4.50**

253M4 Mechanical Stage, Compound. Each....................**$50.00**

253M5 Objectives. Achromatic; 10X (16 mm.); free from polarization. **Each**....................**$10.00**

253M6 Objectives. Achromatic; 45X (4 mm.); free from polarization. **Each**....................**$18.75**

253M7 Eyepieces. Huyghens; 5X; with adjustable eyelens and crosswebs. **Each**....................**$ 7.00**

253M8 Eyepieces. Huyghens; 8X; with adjustable eyelens and crosswebs. **Each**....................**$ 7.00**

253M9 Plates, Selenite. Red, 1st order, in mounting. **Each**.........**$ 4.50**

253M10 Plates, Mica. ¼ und., in mounting. **Each**................**$ 3.50**

253M11 Wedges, Quartz. 1-4 order, in mounting. **Each**............**$25.00**

253M12 Microscopes, Leitz, Ore Model MOP. For reflected polarized light. For use in ore microscopy, study of mineral coals, carboniferous sandstone, lignite, coke, and in the metal industry. Consists of an object stage, 120 mm. revolving on ball bearings with graduations; vernier and clamp arresting device; coarse and fine adjustment; anastigmatic tube analyzer in sliding mount and rotatable through 90°; improved large vertical illuminator; objective centering and changing clutch with four collars; and polarizer for inserting into entrance tube. Includes achromatic objective, 5.5X; achromatic objective, 16.5X; fluorite objective, 45X; fluorite oil immersion objective, 80X; eyepiece, 8X, with crosslines and focusing eyelens; Periplan eyepiece, 8X; Periplan eyepiece, 12X. (Magnifications 45X to 950X.) Complete without substage for transmitted light. **Each** in case....................**$519.00**

Accessories for Observation in Transmitted Polarized Light

(Not included with 253M12 and must be purchased extra if desired.)

253M13 Mirrors. Plane and concave. Rotating. **Each**..............**$ 7.00**

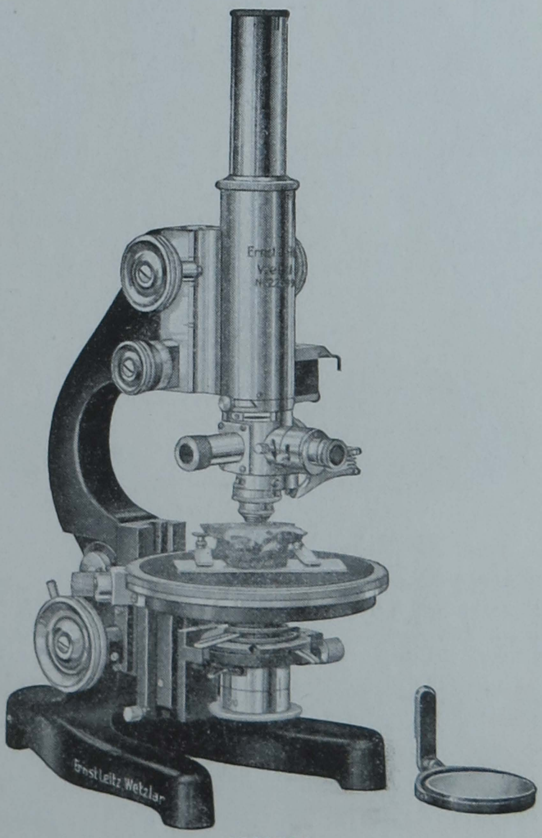
253M14 Medium Substage. With rack and pinion motion, a condenser system composed of 3 lenses, polarizer in mount; and an iris diaphragm serving as an aperture stop. The condenser N. A. 1.0 is put out of action by means of a knob. **Each**....................**$94.00**

253M15 Plates, Gypsum. Red, 1st order and mica plate ¼ W. L. in mount for the tube slit. **Each**....................**$ 8.25**

253M16 Object Spring Clips. Each....................**$ 2.25**

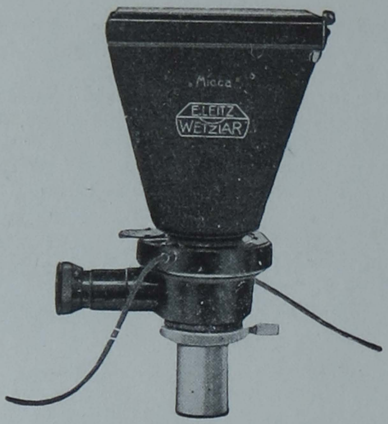
253M17 Lenses, Bertrand Auxiliary. With helical motion and diaphragm, to screw on to the eyepiece, with focusing mark for different eyepieces. **Each**....................**$10.00**

253M18 Objectives. Achromatic; 45X; in short mount. To be used in place of 45X fluorite objective listed with 253M12. **Each**....................**$17.00**



253M12

Microscope Accessories



254M1

254M1 Cameras, Photomicrographic, Leitz. Attaches directly to all standard microscopes by sliding into the microscope tube in place of the eyepiece. This equipment will permit taking photomicrographs on plates 3¼x4¼ inches. It is furnished with a Periplan eyepiece, 10X, and a side telescope which allows constant observation of the object while taking photographs. A shutter is supplied for time and instantaneous exposure. The plateholders are held firmly in place by two spring clips. Complete as described with Periplan eyepiece, two plate holders for 3¼x4¼-inch plates, one ground glass screen, and two wire release attachments. **Each**..........$80.00

254M2 Plateholders. 3¼x4¼ inches. **Each**..........$1.50

254M3 Photomicrographic Equipment, Leitz. Same as 254M1, except with filmpack adapter for films in place of plate-holders, 3¼x4¼ inches. **Each**..........$82.00

254M4 Filmpack Adapters. For 3¼x4¼-inch films. **Each**..........$5.00

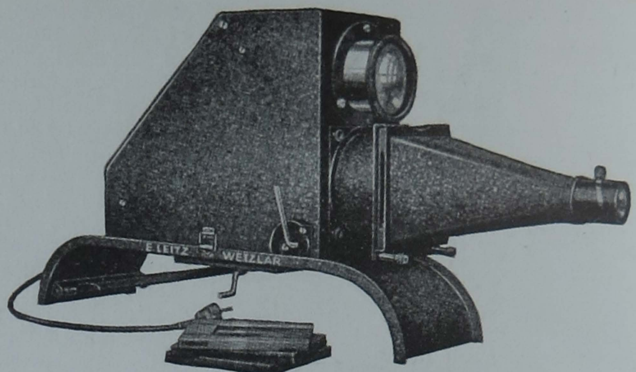
254M5 Photomicrographic Equipment, Leitz. Same as 254M1, except with plateholders for 1¾x2⅜-inch plates. **Each**..........$66.00

254M6 Plateholders. 1¾x2⅜ inches. **Each**..........$1.50

254M7 Photomicrographic Equipment, Leitz. Same as 254M5, except with filmpack adapter for films, in place of plateholders, 1¾x2⅜ inches. **Each**..........$67.00

254M8 Filmpack Adapters. For 1¾x2⅜-inch film. **Each**..........$4.00

254M9 Micro Attachment. Intended for use with the Leica camera in taking photographs through the microscope. Equipped with a conical extension tube, with correction lens giving an initial magnification of ⅓X, Compur shutter and reflecting focusing magnifier. Complete with Periplan 10X eyepiece and two wire cable releases, in case. **Each**..$56.00



254M10

254M10 Projectors, Combination, Leitz Model Vp. Recommended for school use.

1 250-watt projection lamp, used as a light source, and a quadruple system of mirrors assures a most intense and brilliant image. The lens for opaque projection is a 325 mm. objective F/3.6. The 250-watt bulb eliminates the necessity of a fan. Housing is provided with efficient ventilation facilities. For projection of lantern-slides, a 190 mm. focal length objective is supplied.

This projector is most conveniently used at screen distances of from 9 to 16 feet. The corrected lenses and the illuminating system offer a sharp and brilliant image right to the corners. The picture projection area of the field is 5½x5½ inches. The standard lantern-slide frames fit readily into a slider for projection. The projector can be attached to any house circuit, operating efficiently at 110 to 120 volts. The entire upper housing can be detached from the frame and placed upon any large map or surface in the event that tha latter can not fit conveniently on the opaque projection stage.

Distance of projection, feet	10	13	16	20
Size of picture, approximate inches	46	64	80	98

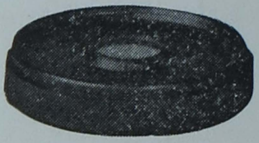
Complete with cord and plug. **Each**..........$120.00

254M11 Carrying Cases, Special. Reinforced vulcan fiber. **Each**..........$14.60

254M12 Bulbs, Spare. 250-watt, 110 volt. **Each**.....$7.00

254M13 Plates, Hard Glass. In frame, to flatten objects (postcards, maps, etc.) and to protect them from becoming overheated. **Each**..........$2.25

Polarized Equipment, Marks



254M15

254M14

254M16

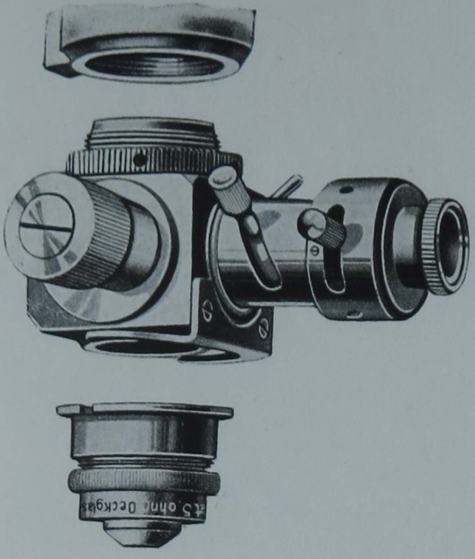
254M14 Polarizers. Consists of a ⅜-inch diameter machined brass fitting in which a 5 mm. aperture Marks polarizing biplate is mounted. This fitting is set in a Bakelite slab or table 3x1x1/16 inch which rests upon the stage of the microscope, the polarizer mounting slipping within the aperture of the stage. Microscope slide sets in the usual position on top of the Bakelite table, both being held in place by the stage clips. **Each**..........$3.75

254M15 Analyzers. For use with 254M14 polarizer. Used by placing in a free position over the eyepiece of the microscope. **Each**..........$4.10

254M16 Analyzers. For use with 254M14. Screws into thread (R. M. S. standard) at bottom of draw tube, and is thus in a position between the objective and the eyepiece. **Each**..........$9.50

254M17 Polarizers. Unmounted. For measurements of crystallographic angles with revolving stage. Placed directly under the slide and over the substage condenser in a fixed position. **Each**..........$2.65

Microscope Accessories, Leitz



255M1

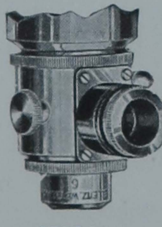
255M1 Illuminators, Vertical. For illuminating objects, such as metal surfaces, etc., for examination with the microscope. This accessory is provided with a society thread by which it attaches to the tube of any standard microscope. The vertical illuminator is equipped with a simplified objective clutch by means of which the objectives, being provided with adapter collars, are held in place and can be changed easily.

A total reflecting prism and a reflecting glass plate are mounted simultaneously to a bar. The bar, fully inserted into the illuminator housing, places the total reflecting prism within the optical rays; when the bar is withdrawn to its extreme stop, the reflecting glass plate is within the optical rays. The use of either depends upon the nature of the specimen and the objective employed. This vertical illuminator is equipped with a condensing lens and iris diaphragm, by means of which the light rays can be controlled for proper contrast. Complete with three objective adapter collars, in case. **Each**......................................**$37.50**

Note: Lamp attachment for 255M1, shown on page 247.

255M2 Frames. With reflecting glass plate. For use with low power objectives (40 mm.), fitting over the front mounting of the objectives. **Each**..........................**$3.75**

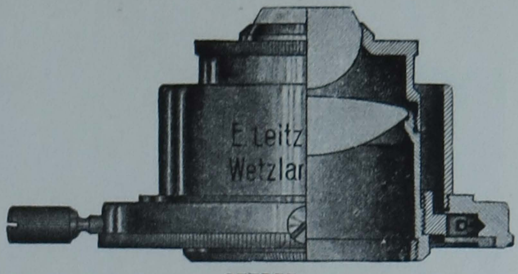
255M3 Adapter Collars. For objective. **Each**.......**$1.00**



255M4

255M4 Illuminators, Vertical, Simplified. For convenient illumination of opaque objects for microscopical examination. This model is much simpler in type than the large vertical illuminator and consequently does not permit an application in a similar universal manner. It is equipped with a total reflecting prism and iris diaphragm, the latter serving to stimulate the light concentration. Complete in case. **Each**..**$21.50**

Note: A special series of short mounted objectives is offered for the examination of opaque objects, a list of which will be supplied upon request.



255M5

Condensers, Substage, Divisible. For use with simplified substage with rack and pinion movement. Used in connection with microscopes for routine laboratory work.

255M5 Condensers, Two-Lens. N. A. 1.20. With iris diaphragm. **Each**...**$12.50**

255M6 Condensers, Two-Lens. N. A. 1.20. Without iris diaphragm. **Each**...................................**$7.50**

255M7 Condensers, Three-Lens. N. A. 1.40. With iris diaphragm. **Each**...**$14.50**

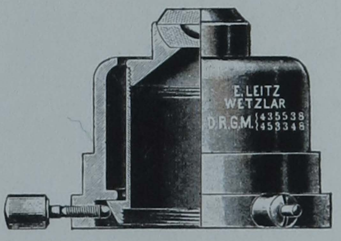
255M8 Condensers, Three-Lens. N. A. 1.40. Without iris diaphragm. **Each**...................................**$9.50**

255M9 Condensers, Aplanatic-Achromatic. N. A. 1.40. With iris diaphragm. **Each**........................**$35.00**

255M10 Condensers, Aplanatic-Achromatic. N. A. 1.40. Without iris diaphragm. **Each**.....................**$30.00**

255M11 Iris Diaphragms. With thread to attach to substage condensers. **Each**..............................**$5.00**

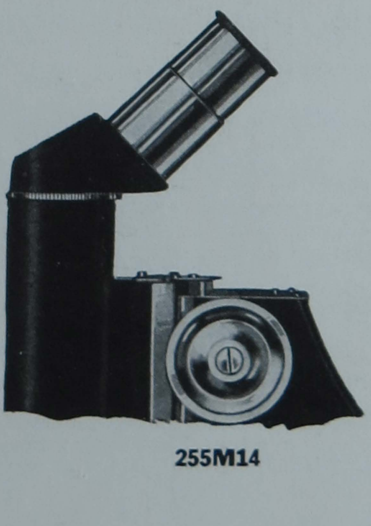
255M12 Centering Adapters. For above condensers. Consists of a cylindrical mount in which operates a steel cone by means of centering screws. **Each**................**$10.00**



255M13

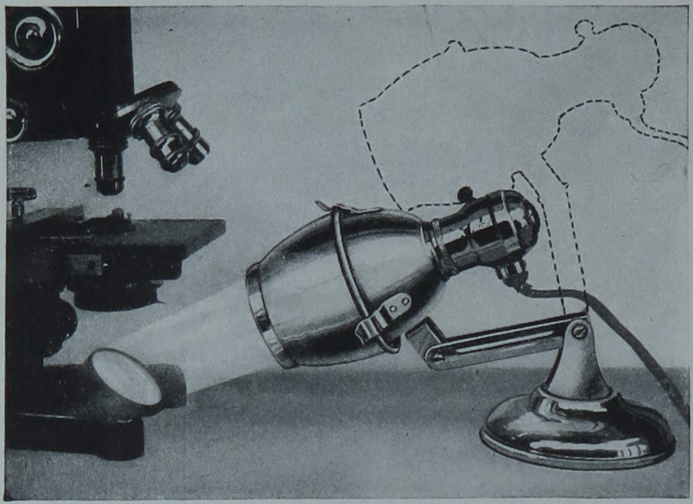
255M13 Condensers, Darkfield, Model A. Designed for use with high power objectives, and is furnished in a centering mount to be used in the microscope substage. Has a short focal length, therefore can be utilized with practically all Leitz microscopes. Darkfield condensers D 1.20A with funnel stop represents an immersion condenser for high power work. It is particularly suitable for smear preparations and the observation of objects imbedded in the media having refractive indices exceeding 1.0 (water, balsam). It is provided with a centering device, and in view of its short focal length, has its pencils of rays brought to a focus with great precision. In case. **Each**...........**$26.00**

255M14 Eyepiece Holders, Inclined. For monocular microscopes. Enables one to assume a natural sitting position while working at the monocular microscope. Is extremely convenient for differential blood counts and for examining liquid specimens, especially when the stage must be kept in a horizontal position. It is attached easily and quickly to the monocular microscope. **Each**...**$20.00**

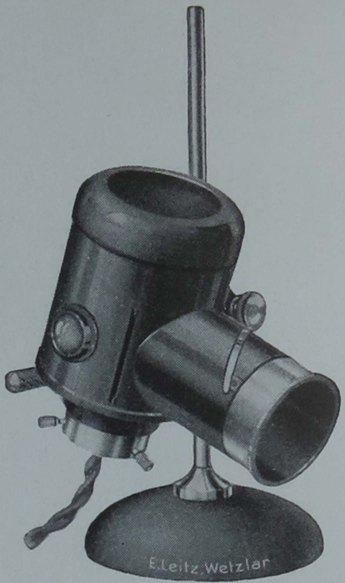


255M14

Microscope Accessories, Leitz, Continued



256M1



256M5

256M1 Microscope Lamps, Leitz. A light source suitable for all observations from lowest to high magnifications and for monocular as well as binocular vision. It is equipped with a special bulb which supplies diffused light of sufficient intensity and of a spectral composition similar to daylight.

The housing is of simple design; it offers sufficient protection against stray light, and at the same time it provides for an adequate ventilating air current to prevent overheating.

The jointed arm between foot and housing is particularly valuable, since it elevates the housing and thus the rays for the illumination of opaque objects on the stage when using binocular microscopes of the Greenough type. For regular illumination by transmitted light, the lamp housing is lowered by collapsing the jointed arm, so that the full intensity falls upon the microscope mirror. Complete with daylight bulb, 50-watt, 110-volt cord and plug. **Each** $9.00

256M2 Microscope Lamps. Same as 256M1, except with daylight bulb, 50-watt, 220-volt, cord and plug. **Each** $10.00

256M3 Lamp Bulbs. 50-watt, 110 volt (for replacement). **Each** .... $ .55

256M4 Lamp Bulbs. 50-watt, 220-volt (for replacement). **Each** $1.55

256M5 Microscope Lamps, Universal, Leitz. For microscopical observations, Darkfield work and photomicrography. Represents a powerful incandescent lamp equipped with Nitra bulb, 6-volt, 5-amperes. This lamp consists of a housing, black lacquered, fastened to a vertical upright with foot by means of a cross jointed clamp, permitting the lamp housing to be conveniently tilted. By raising it sufficiently, it serves to illuminate either the entrance tube of vertical illuminators or directly opaque specimens placed on the microscope stage.

The cylindrical tube carries a condensing lens focusing by means of a spiral screw device. The lamp bulb is attached to a centering socket, enabling the lamp filament to be correctly oriented for a maximum light within specific values of the spectrum. This is accomplished through the use of special filters and by the means of an adjustable rheostat or transformer, supplied with ammeter. Upon request, we are prepared to furnish details relative to these filters and rheostat or transformer. Consists of stand, housing, Nitra lamp bulb 6-volt, 5-amp., collimator illuminating system, complete as described; without filter, rheostat or transformer. **Each** $29.00

256M6 Lamps. Same as 256M5, except with rack and pinion motion for the illuminating lens. **Each** $36.50

256M7 Lamps. Same as 256M5, except with special aspherical illuminating lens. **Each** $33.50

256M8 Lamps. Same as 256M7, except with rack and pinion motion for the aspherical lens. **Each** $41.00

256M9 Iris Diaphragms. In mount to clamp to the front of the Universal Lamp, 256M5. **Each** .... $ 7.50

256M10 Stands. For Lifa filters. Mounted to foot, adjustable in height, and inclinable. **Each** .... $ 8.00

256M11 Special Filters. Lifa No. 1658/26 for daylight .... $ 6.25

256M12 Filters. Lifa No. 215 (for C line). **Each** .... $ 6.25

256M13 Filters. Lifa No. 395 (for D line). **Each** .... $ 6.25

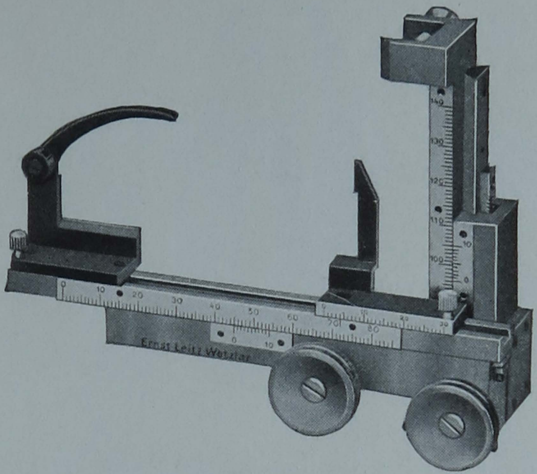
256M14 Filters. Lifa Nos. 370 plus 391 (for F line). **Each** $12.50

Note: Above lamp is to be used with rheostat or transformer, dependent upon current conditions, and if the lamp is desired as general microscope illuminant without attaching special importance to specific spectral values of light, selection should be made from the following items:

256M15 Rheostats. Stationary, for Nitra lamp on 110-volt D. C. **Each** $10.50

256M16 Transformers. Stationary, for Nitra lamp on 110-volt A. C. **Each** .... $ 7.00

Microscope Accessories, Leitz, Continued



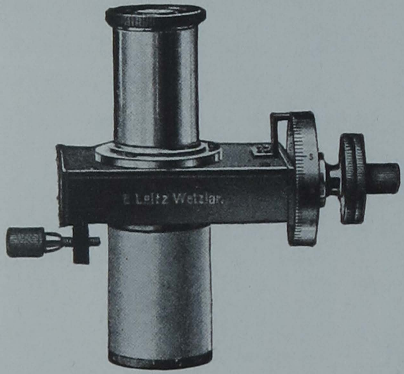
257M1

257M1 Mechanical Stages. Used with all microscopes having square stages. Attaches to side the of the microscope stage. Movement of the slide is controlled by two racks and pinions and thereby affords a methodical examination of specimens. Two verniers and millimeter scales are provided to permit a point for reorientation of the slide within an accuracy of ⅒ mm. The slide holders are adjustable for the accommodation of slides of varying sizes. In case. **Each**.................................... **$33.00**

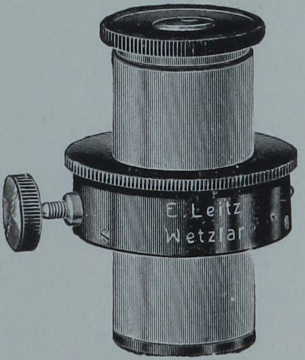
257M2 Mechanical Stages. Same as 257M1, except without millimeter scales and verniers. In case. **Each**............ **$25.00**

257M3 Microscope Eyepieces, Widefield, 8X. For use with achromatic objectives of low and medium magnifications. Fits standard diameter tubes and increases the field of view approximately 30%. **Each**.................................... **$6.25**

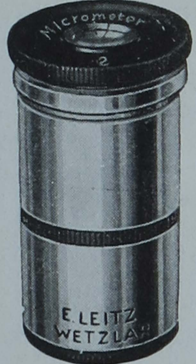
257M4 Microscope Eyepieces, Widefield, 12.5X. Otherwise, same as 257M3. **Each**............................ **$6.25**



257M5



257M6



257M7

257M5 Micrometer Eyepieces, Filar Screw. Intended for the most accurate measurements. A micrometer screw with divided drum is attached to a slider which carries a movable index line. One complete revolution of the drum displaces the index line by 0.5 mm. Since the drum is divided into 100 intervals it follows that the displacement by one interval is equal to 0.005 mm. while .001 mm. can be estimated easily. The eyepiece is of Ramsden type of 12.5X. The eyelens being adjustable, it can be focused easily and sharply upon the scale. The filar micrometer can be attached to any microscope inasmuch as it fits into the draw tube. In case. **Each**.................................... **$45.00**

257M6 Micrometer Eyepieces, Huyghens. With 10 mm. movable scale, divided into 100 parts, a sharp focus upon which is facilitated by an adjustable eyelens. In case. **Each**.................................... **$24.00**

257M7 Micrometer Eyepieces, Huyghens. Same as 257M6, except has a fixed scale. Without case. **Each**............ **$8.75**

257M8 Microscope Eyepieces, Huyghens (Oculars). Available for use with all Leitz objectives, though primarily designed for combination with fluorite and achromatic lenses. So computed as to cause the lower principal focus for all oculars to be in the same plane, so that an adjustment which has been made with any one ocular will hold good for the others also. Accordingly, any interchange of oculars does not necessitate any refocusing.

Magnification number	4X	5X	6X	8X	10X	12X	16X
Equivalent focal length, mm.	62.5	50	41.65	31.25	25	20.85	15.62
Each	**$3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**4.50**

257M9 Microscope Eyepieces, Periplan (Oculars). A new series to replace compensating oculars. Has a flatness of field to utmost periphery of image. Increases the size of the image up to 50%. Serves to eliminate the curved image obtained with microscope objectives and to overcome the attending defects so readily noticeable towards the periphery of these images. Eyelens consists of one negative flint and one positive crown lens, the focal lengths of which have been selected for the purpose of achieving the desired correction of the curved image.

Magnification number	4X	5X	6X	8X	10X	12X	15X	20X	25X
Equivalent focal length, mm.	62.5	50	41.65	31.25	25	20.85	16.65	12.5	10
Each	**$7.25**	**7.25**	**7.25**	**7.25**	**10.25**	**10.25**	**10.25**	**10.25**	**10.25**

Microscope Accessories, Leitz, Continued

258M1—22050

258M1—22054

258M1—22062

258M1 Microscope Objectives, Apochromatic. For the highest type of work in research and photo-micrography. The increased efficiency in optical properties is due to the use of Fluorite in their construction, which makes possible a high degree of transparency, and a low refractive index.

The combination of Fluorite with a much less refringent glass than any of the usual types of flint glasses furnishes extremely favorable conditions for eliminating spherical aberration. Therefore, the configuration of the spectrum, as produced by a Fluorite prism, is very nearly similar in the relative position of its color bands to that obtained with some of the glasses which are available for use in the place of the older flints. This property furnishes a means of uniting at least three optically significant colors.

Objectives in which achromatisation does not extend to more than two colors exhibit residual dispersion or what is known as the secondary spectrum. This imperfection is eliminated by bringing about the fusion of more than two colors with the aid of Fluorite.

Type No.	Magn. No.	Equivalent Focal mm.	Type of Objective	N. A.	Working Distance mm.	Micrometer Value[1] with 6X Ocular mm.	**Each**
22050	12X	16	Dry	0.30	5	0.0143	**$32.50**
22052	23X	8	Dry	0.65	0.85	0.0072	**49.00**
22054[2]	46X	4	Dry	0.95	0.20	0.0035	**65.00**
22056[2]	65X	3	Dry	0.95	0.15	0.0026	**70.00**
22058[3]	65X	3	Oil Im.	1.32	0.13	0.0025	**86.00**
22060	65X	3	Oil Im.	1.40	0.13	0.0025	**135.00**
22062	92X	2	Oil Im.	1.32	0.11	0.00175	**86.00**
22064[4]	92X	2	Oil Im.	1.40	0.05	0.00175	**135.00**

[1] Value on the stage of 0.1 mm. in the focal plane of the ocular.

[2] The objectives Nos. 22054 and 22056 are supplied with coverglass correction collar.

[3] The immersion No. 22058 is likewise supplied as a special objective for darkfield examination with N. A. 1.15. **Price**...**$58.00**

[4] Even while the mounting of the front lens of objective No. 22064 may be considered exceedingly solid, in view of the extreme numerical aperture, it is nevertheless suggested to exercise utmost care when using the objective in order to preclude displacement of the front lens.

258M2 Microscope Objectives, Achromatic. Used chiefly for routine laboratory investigations and for this purpose are fully efficient as to their optical properties relative to chromatic and spherical correction. All are dry, except Nos. 22019, 22020, which are water immersion; and Nos. 22021, 22021a, 22022, and 22022b, which are oil immersion.

Type Number	Magn. No.	Equivalent Focal Length mm.	N. A.	Working Distance mm.	Micrometer Value[1] with Ocular 6X mm.	**Each**
21998[2]	1X	56	0.05	55	0.143	**$5.75**
22000[3]	2.7X	42	0.008	40	0.058	**6.00**
22001[4]	3.2X	24	0.08	3.2	0.0445	**6.00**
22002	3.2X	40	0.12	34.5	0.049	**6.00**
22005	4.3X	32	0.15	27	0.037	**7.00**
22006	6X	24	0.20	16	0.0275	**7.25**
22007	8X	20	0.30	7.7	0.02	**9.00**
22009[5]	4.5-10X	29–16	0.25- 0.15	5.8-26	0.037– 0.0156	**9.00**
22010	14X	13	0.40	3.2	0.012	**11.25**
22012	20X	9	0.45	2.0	0.008	**15.25**
22014	30X	6	0.65	0.75	0.005	**15.25**
22016	45X	4	0.85	0.32	0.0036	**17.00**
22017[6]	45X	4	0.65	0.60	0.0036	**17.00**
22018[7]	62X	3	0.85	0.28	0.0025	**20.00**
22019	50X	3.6	1.00	0.40	0.003	**36.00**
22020	90X	2.1	1.20	0.10	0.0018	**50.00**
22021	10X	16	0.25	0.65	0.016	**25.00**
22021a	22X	8	0.65	0.45	0.008	**35.00**
22022	100X	1.8	1.30	0.11	0.0016	**35.00**
22022b	90X	1.8	1.25	0.13	0.00175	**35.00**

[1] Value of the stage of 0.1 mm. in the focal plane of the ocular.

[2] No. 21998 is to be attached directly to the thread of the draw tube.

[3] No. 22000 consists of one double lens only and therefore offers less light than objectives Nos. 22001 and 22002.

[4] In general, the objective No. 22002 is given preference due to its large working distance while if it is preferred to have a low power objective of 3.2X adjusted to the nosepiece so as to be parfocal with the other objectives, then the objective No. 22001, having a working distance of 3.2 mm. should be selected.

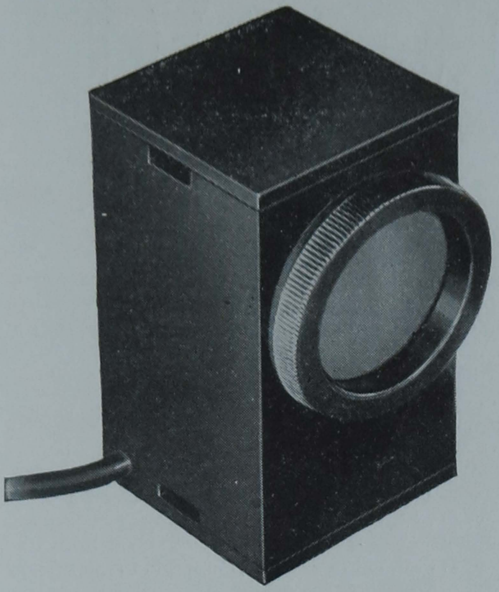
[5] No. 22009 represents a divisible objective; by unscrewing the front lens, the remaining unit will render a varying magnification from the combined magnifying power obtained with the entire unit.

[6] No. 22017 possesses a long working distance and is especially recommended for blood counting work.

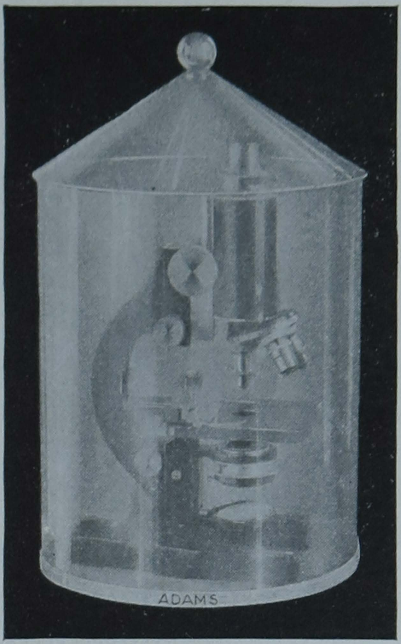
[7] Objective No. 22018 can be furnished with coverglass correction collar, additional charge, $10.00.

Note: For Darkfield examination, it is necessary that all apochromatic oil immersion objectives, achromatic dry objectives Nos. 22016, 22017, and 22018, water immersion No. 22020, achromatic oil immersion No. 22022 and 22022b, be appropriately reduced in their numerical aperture in order to create sufficient contrast within the darkfield. This is accomplished through the interposition of an objective iris diaphragm; the diaphragm being mounted within an independent objective body, readily accommodates the lens portion of the objectives above referred to. The objective diaphragm is furthermore used advantageously for binocular vision since thereby the focal depth can be materially increased towards enhancing the perspective value of objectives.

Microscope Accessories, Continued



259M1



259M6

259M1 Microscope Substage Lamps, Bakelite. Light weight and durable. Simply constructed. Gives a bright light. The light from the bulb is reflected from the reflector on the inside of the housing through a thick blue glass filter that is frosted on one side, thereby giving proper dispersion of light. Complete with 10-watt Mazda bulb and 6-foot cord and plug. **Each** **$2.50**

259M2 Microscope Substage Lamps. With blue daylight Mazda bulb. Otherwise, same as 259M1. **Each** **$3.00**

259M3 Bulbs, Only, Mazda.

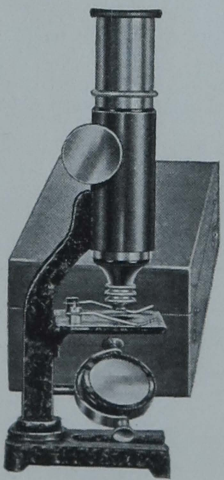
Watts	10	15
Each	**$ .40**	**.65**

259M4 Bulbs, Only, Mazda, Blue Daylight. 10-watt. **Each** .... **$ .90**

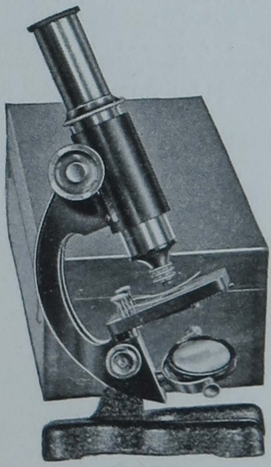
259M5 Microscope Oil Immersion Bottles. Capped. With rod for immersion in oil. **Each** .... **$ .90**

259M6 Microscope Covers, Bell Jar. Made of transparent cellulose acetate, and is unbreakable. It weighs only $^1/_{30}$th as much as glass covers of the same size, and can be placed over microscopes without danger of damage to the instrument. Diameter, 10 inches; height, 15 inches. **Each** **$4.50**

259M7



259M8



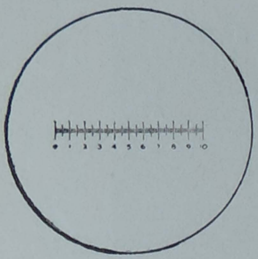
259M9

259M7 Microscopes, Student. Power range, 150X to 200X. Equipped with double rack adjusters, two detachable objectives, tilting stand and locking device. Height overall, 7½ inches. **Each** **$7.75**

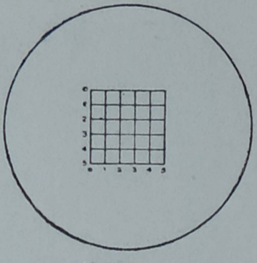
259M8 Microscopes, Student. With six different power ranges: 30X, 70X, 105X, 80X, 140X and 250X, and three individual detachable objectives. The three highest powers are obtained by extending the ocular tube in the main housing. The stand is of one piece with under-stage disc with three apertures. Overall height of microscope with stand is 7½ inches. Complete in mahogany wood box with sample slides. **Each** **$12.50**

259M9 Microscopes, Student. With six different powers: 55X, 110X, 170X, 100X, 200X and 350X. The last three ranges of high power are obtained by the eye-piece. By extending the ocular tube one can increase the power up to 350X. Microscope is equipped with double wheel adjusters, three individual detachable objectives, and tilting stand with under-stage disc with three apertures. Overall height, 9 inches. Complete with mahogany cabinet and sample slides. **Each** **$21.50**

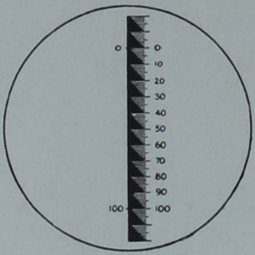
Microscope Accessories, Continued



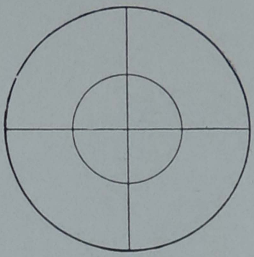
250M2



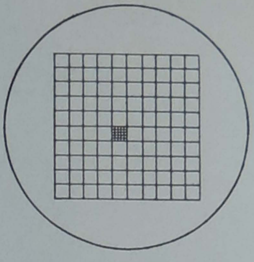
260M4



260M5



260M6



260M8

Micrometer Discs. Consists of a glass disc, in mounting of a diameter to fit the standard microscope eyepiece. The lines of the disc are black and easily read. Supplied in artificial bone capsule.

260M1 Micrometer Discs, Linear Ruling. 5 mm. graduated in 0.05 mm. divisions. every whole millimeter line numbered. **Each**........**$4.00**

260M2 Micrometer Discs, Linear Ruling. 10 mm. graduated in 0.1 mm. divisions; every whole millimeter line numbered. **Each**........**$5.00**

260M3 Micrometer Discs, Square Ruling. 5 mm. square, divided into square areas 0.5 mm. on a side; with every second line on two adjacent sides numbered. **Each**........**$4.00**

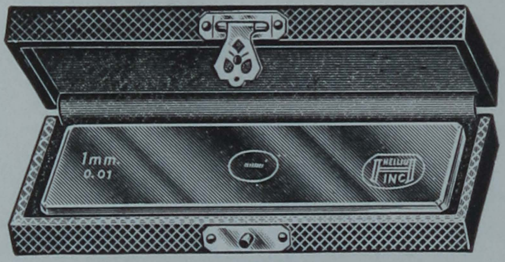
260M4 Micrometer Discs, Square Ruling. 5 mm. square, divided into square areas 1.0 mm. on a side; with every line on two adjacent sides numbered. **Each**........**$4.00**

260M5 Micrometer Discs, Step. The divisions are arranged in 14 groups of ten, each group being indicated by a black echelon rising from the first to the tenth division. Each major division from the second to the twelfth group is numbered as illustrated. **Each**........**$6.50**

260M6 Micrometer Discs, Breed and Brew. For examination of milk smears. Consists of a ruled circle, 8 mm. in diameter, divided into quadrants. **Each**........**$5.00**

260M7 Micrometer Discs, Howard. For mould counting. Ruled in squares. **Each**........**$5.00**

260M8 Micrometer Discs, Whipple. For counting bacteria. The large area is divided into 100 small squares, one of which is divided into 25 squares, as illustrated. **Each**........**$5.00**



260M9

Micrometers, Stage. Standard size, 76x26 mm. (3x1 inches).

260M9 Micrometers, Stage. 1 mm. graduated in 0.01 mm. divisions; with every 0.1 millimeter line numbered. In velvet lined case. **Each**........**$6.00**

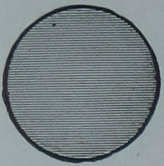
260M10 Micrometers, Stage. 2 mm. graduated in 0.01 mm. divisions; with every 0.1 millimeter line numbered. In velvet lined case. **Each**........**$6.50**

260M11 Micrometers, Stage. 10 mm .graduated in 1.0 mm. divisions, and the last 1.0 mm section divided into 0.1 mm divisions; with every whole millimeter line numbered. In velvet lined case. **Each**........**$6.00**

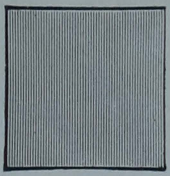
260M12

260M12 Microscopes, Dissecting. The horseshoe base holds the lens rigidly at the proper focal distance; a clamping device permits rapid focusing. The 4.5X lens is a doublet corrected for chromatic and some spherical aberrations. The lens is 36 mm. in diameter. It gives an extremely large field—color free and flat to its edges. **Each**........**$8.50**

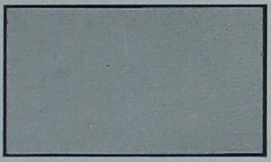
Microscope Accessories, Continued



261M1



261M5



261M9

261M1 Microscope Cover Glasses, Round, No. 1, Gold Seal. Non-corrosive; do not fog; gauged accurately; and free from bubbles, striations and other defects. Thickness, 0.13 to 0.16 mm. Packed in ½ ounce boxes.

Diameter, inches	⅝	¾	⅞	1
Diameter, mm	15	18	22	25
Number in ounce, approx.	360	280	182	120
Ounce	**$2.58**	**2.15**	**2.15**	**2.15**

261M2 Microscope Cover Glasses, Round, No. 2, Gold Seal. Same as 261M1, except thickness is 0.17 to 0.25 mm. Packed in ½-ounce boxes.

Diameter, inches	⅝	¾	⅞	1
Diameter, mm	15	18	22	25
Number in ounce, approx.	285	200	155	92
Ounce	**$2.22**	**1.85**	**1.85**	**1.85**

261M3 Microscope Cover Glasses, Round, No. 1, Clinical Grade. Non-corrosive. Thickness 0.13 to 0.16 mm. Packed in ½-ounce boxes.

Diameter, inches	¾	⅞
Diameter, mm	18	22
Number in ounce, approx.	280	182
Ounce	**$1.25**	**1.25**

261M4 Microscope Cover Glasses, Round, No. 2, Clinical Grade. Same as 261M3, except with thickness of 0.17 to 0.25 mm. Packed in ½-ounce boxes.

Diameter, inches	¾	⅞
Diameter, mm	18	22
Number in ounce, approx.	200	155
Ounce	**$1.00**	**1.00**

261M5 Microscope Cover Glasses, Square, No. 1, Gold Seal. Non-corrosive; do not fog; gauged accurately; and free from bubbles, striations, and other defects. Thickness, 0.13 to 0.16 mm. Packed in ½-ounce boxes.

Side, inches	⅝	¾	⅞	1
Side, mm	15	18	22	25
Number in ounce, approx.	290	206	150	120
Ounce	**$1.80**	**1.50**	**1.50**	**1.50**

261M6 Microscope Cover Glasses, Square, No. 2, Gold Seal. Same as 261M5, except with thickness of 0.17 to 0.25 mm. Packed in ½-ounce boxes.

Side, inches	⅝	¾	⅞	1
Side, mm	15	18	22	25
Number in ounce, approx.	240	162	120	192
Ounce	**$1.56**	**1.30**	**1.30**	**1.30**

261M7 Microscope Cover Glasses, Square, No. 1, Clinical Grade. Non-corrosive. Thickness, 0.13 to 0.16. Packed in ½-ounce boxes.

Side, inches	¾	⅞
Side, mm	18	22
Number in ounce, approx.	206	150
Ounce	**$ .90**	**.90**

261M8 Microscope Cover Glasses, Square, No. 2, Clinical Grade. Same as 261M7, except with thickness of 0.17 to 0.25. Packed in ½-ounce boxes.

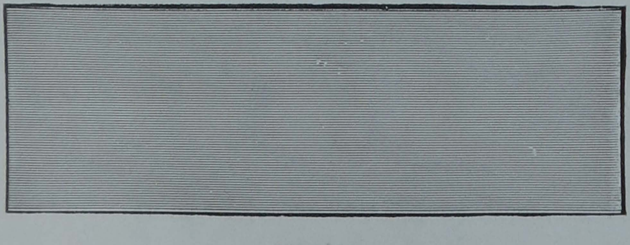
Side, inches	¾	⅞
Side, mm	18	22
Number in ounce, approx.	162	120
Ounce	**$ .80**	**.80**

261M9 Microscope Cover Glasses, Rectangular, No. 1, Gold Seal. Non-corrosive; do not fog; gauged accurately; and free from bubbles, striations, and other defects. Thickness, 0.13 to 0.16 mm. Packed in ½-ounce boxes.

Width mm	22	22	22	24	24	43
Length, mm	30	40	50	40	50	50
No. in oz., approx.	120	96	76	90	64	32
Ounce	**$1.50**	**1.50**	**1.50**	**1.50**	**2.00**	**2.00**

261M10 Microscope Cover Glasses, Rectangular, No. 2, Gold Seal. Same as 261M9, except with thickness of 0.17 to 0.25. Packed in ½-ounce boxes.

Width mm	22	22	22	24	24	43
Length, mm	30	40	50	40	50	50
No. in oz., approx.	106	80	54	68	52	30
Ounce	**$1.30**	**1.30**	**1.30**	**1.30**	**1.60**	**1.60**



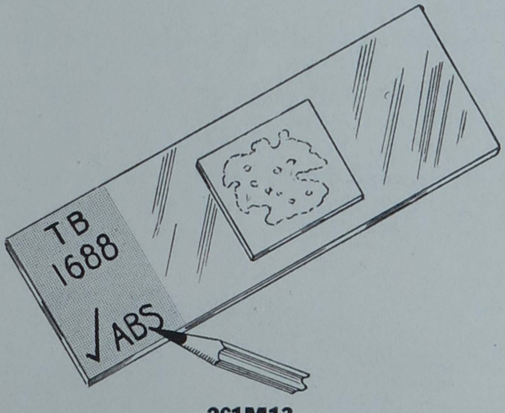
261M11

261M11 Microscope Slides, Gold Seal. Non-corrosive; do not fog. Edges are well ground, polished and slightly beveled. Selected to eliminate bubbles, striations, scratches, etc. Average thickness, 1.15 mm. Packed in boxes of ½-gross.

Size, inches	**3x1**	**3x1½**	**3x2**
Size, mm	75x25	75x38	75x50
Gross	**$1.10**	**2.00**	**2.45**

261M12 Microscope Slides, Clinical Grade. Non-corrosive. Free from major defects. Average thickness, 1.15 mm. Size, 3x1 inch (75x25 mm.). Packed in boxes of ½ gross.

Gross	**$ .90**



261M13

261M13 Microscope Slides, with Frosted Writing Space, Clinical Grade. Edges are ground and polished. Average thickness is 1.15 mm. Size, 3x1 inch (75x25 mm.). Packed in boxes of ½ gross.

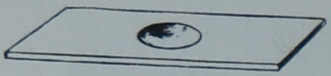
Gross	**$1.35**

261M14 Microscope Slides, Petrographic, Gold Seal. Non-corrosive; do not fog. Edges are well ground, polished, and slightly beveled. Selected to eliminate bubbles, striations, scratches, etc. Average thickness is 1.15 mm. Size, 1¾x1 inch (44x25 mm.). Packed in boxes of ½ gross.

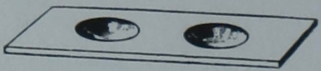
Gross	**$1.35**

Note: Microscope Slides are continued on page 262.

Microscope Accessories, Continued



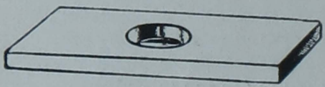
262M1



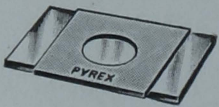
262M2

262M1 Microscope Slides, Culture, Single Depression. Made of clear white, non-corrosive glass with round, ground and polished cavities. Average thickness, 2.5 mm. Dimensions: length, 3 inches; width, 1 inch (75x25 mm.); diameter of cavity, 18 mm.; depth of cavity, .8 mm. **Each**..... **$ .25**

262M2 Microscope Slides, Culture, Two Depressions. Dimensions: thickness, 2.5 mm.; length, 3 inches; width, 1 inch (75x25 mm.); diameter of cavities, 18 mm.; depth of cavities, .8 mm. **Each**.............................. **$ .35**



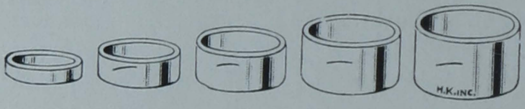
262M3



262M4

262M3 Microscope Slides, Culture, Deep Single Depression. Made of clear white glass with round, ground and polished cavities, and ground and polished edges. Thickness, 4.5 mm. Dimensions: length, 3 inches; width, 1 inch (75x25 mm.); diameter of cavity, 18 mm.; depth of cavity, 3.0 mm. **Each**... **$ .60**

262M4 Microscope Slides, Bacteria Counting Cells, Pyrex. Consists of a top section, 38x38x1 mm. thick with 20 mm. center opening and polished bottom plate, 37x60x2 mm. thick. A regular microscope cover glass may be used as cell cover. Excellent for use in dust counting. **Each**...... **$3.40**

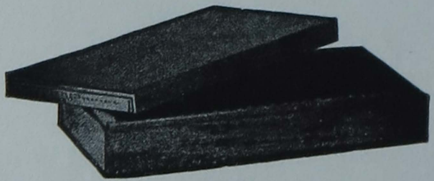


262M5

262M5 Microscope Slide Rings, Glass. For cementing on slides.

Diameter, inside, mm.....	**15**	**18**	**18**	**22**	**24**
Height, mm................	3	5	10	9	10
Each.....................	**$ .30**	**.30**	**.30**	**.35**	**.40**

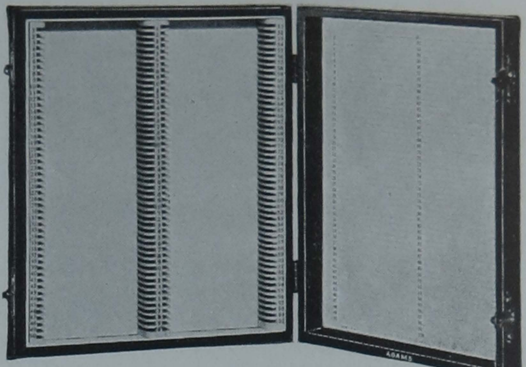
262M6 Microscope Slide Labels. With border. 22 mm. square. Packed in boxes of 100 labels. **Box, $ .15. Dozen Boxes**........................ **$1.50**



262M7

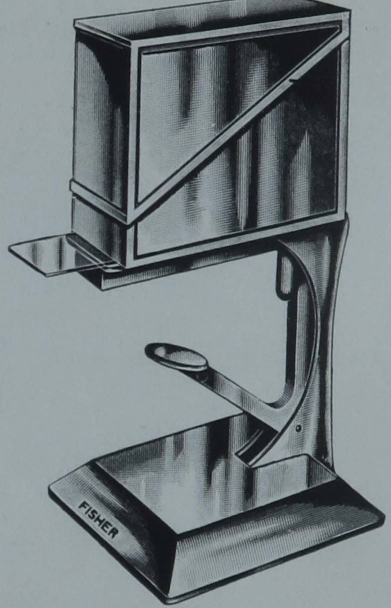
262M7 Microscope Slide Boxes. For 3x1-inch slides. Made of wood, with overlapping cover, the removal of which permits easy withdrawal of each slide projecting above box edges. Holds 25 slides and each groove is numbered to correspond with label on outside of box. **Each**.................. **$ .20**

262M8 Microscope Slide Boxes. Same as 263M1, except for 3x2-inch slides. **Each**.............................. **$ .40**



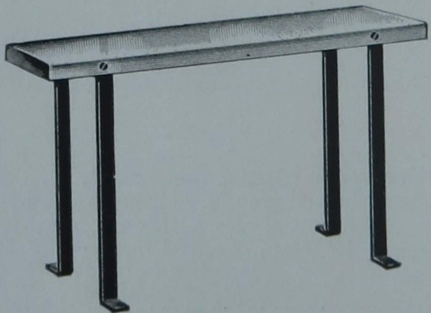
262M9

262M9 Microscope Slide Boxes. For 3x1-inch slides. Made of wood and cardboard, with black-grained finish. Grooved to hold 100 slides. Size of the box is 7½x8 inches, and is provided with 2 brass hinges and 2 brass clasps. **Each**.... **$ .85**



262M10

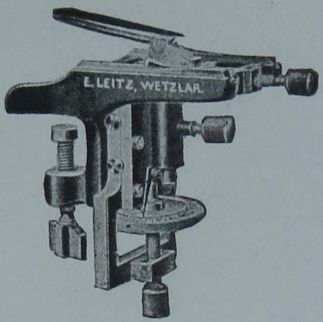
262M10 Microscope Slide Dispensers. Made of non-ferrous die castings finished in bright chrome plate. Stores up to fifty washed and dried standard 75x25 mm. microscope slides; and by the application of light finger pressure on the handle, dispenses them one at a time. **Each**......... **$5.00**



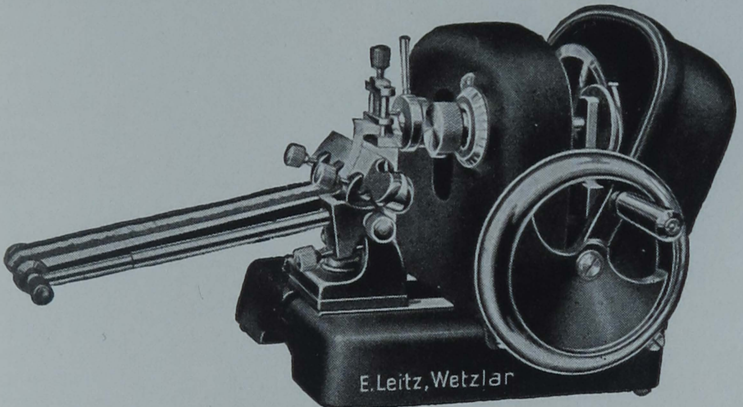
262M11

262M11 Microscope Slide Warming Tables. Expedites warming and fixing of slide specimens. Length, 14 inches; width, 4 inches; height, 8½ inches. Polished copper shelf is supported on sturdy legs. **Each** **$3.50**

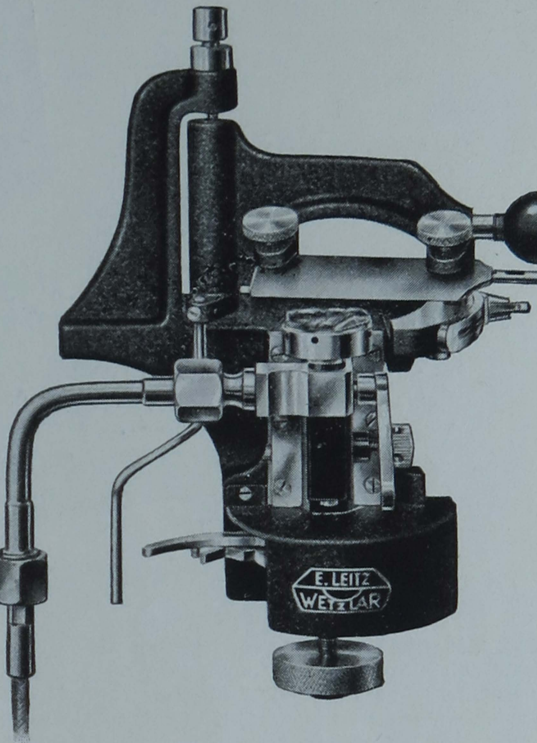
Microtomes, Leitz



263M1



263M3



263M6

263M1 Microtomes, Hand. With object clamp, paraffin stage and stout screw clamp for attachment to the table; with two narrow glass strips 70 mm. long, forming a guiding support for the knife. The object is made to rise by rotating a graduated micrometer screw, each division of which corresponds to a thickness of 10 microns. **Each**........ **$35.00**

263M2 Ether Freezing Apparatus. Consists of a box-shaped freezing stage, rubber bellows, double tubing and a stoppered glass vessel to hold the ether. The surface of the object stage is corrugated to facilitate the adhesion of the specimen. (This apparatus serves excellently for the microtome 263M1 and 263M6. When ordering, please specify for which microtome it is required.) **Each**........ **$20.00**

For razors, see page 264.

263M3 Microtomes, Minot. Used to advantage especially where it is required to cut rapidly from a long series of objects of suitable structure, such as embryos, etc. The housing affords effective protection to the mechanism while at the same time the mechanism is easily accessible by swinging back the rear half of the metal housing. Complete freedom from vibration is afforded because of the heavy base which is mounted on rubber supports. Range of motion in cutting (stroke) is approximately 60 mm. In protective housing; with automatic fine adjustment of specimen; thickness of sections is adjustable from one to 25 microns by means of a knob. A heavily constructed ball and socket clamp holds the object clamp and paraffin stage, both of which are supplied with the microtome. Complete with knife block with knife clamp in one piece and two locking screws for setting knife at any angle to the cutting plane, with scale for reading angle at which knife was set, but without ribbon conveyor. **Each**........ **$231.00**

263M4 Ribbon Conveyor. As illustrated under 263M3. For cutting a continuous series of sections. **Each**........ **$17.50**

263M5 Movable Knife Blocks. To replace knife block in illustration and to permit the knife to be clamped obliquely whereby the instrument becomes available for cutting objects in celloidin. **Each**........ **$35.00**

For knife, Minot, see page 264.
For strop, Zimmer, see page 265.

263M6 Microtomes, Freezing. With stout screw clamp for attachment to the table, including simple object clamp and paraffin stage. The knife describes a radial sweeping motion about an axis pivoted between two centers, and in order to insure the utmost precision when cutting, the knife holder travels along a special slide track. (The knife holder is designed to take the knife cooling attachment after Schultz-Brauns.) The feed of the specimen is automatic and the amount by which the latter rises corresponds to the number of divisions to which the ratchet action is set on the circular scale of the slide track; thickness of the sections is adjustable from 5 to 50 microns. Micrometer feed mechanism is protected from dirt by a special metal cover. **Each**...... **$95.50**

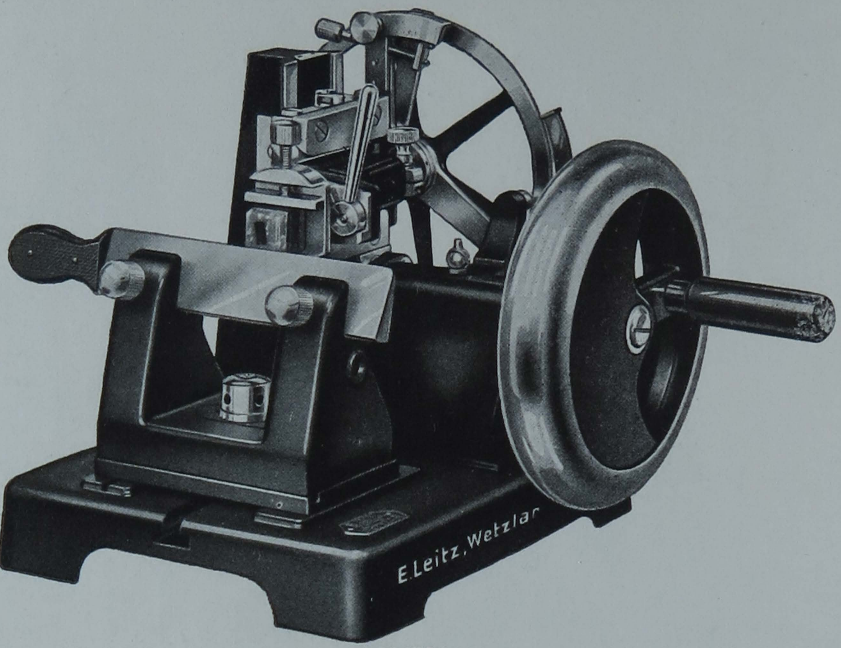
Note: If frozen sections only, i. e., no paraffin sections, are to be cut, the simple object clamp and paraffin stage need not be ordered. In this case, deduct $8.50.

For knives, Jung pattern, see page 264.
For stropping bevels, see page 265.
For strops, Zimmer, see page 265.

263M7 Carbon Dioxide Freezing Apparatus. For attaching the carbon dioxide cylinder by means of a metal tube furnished with this device. Diameter of freezing stage, 3.5 cm. **Each**........ **$18.50**

263M8 Razor Blade Holders. For use with 263M6 microtomes. **Each**........ **$5.00**

Microtomes, Leitz, Continued



264M1

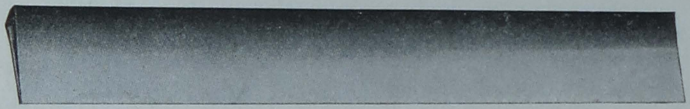
264M1 Microtomes, Minot. Designed with the view of increasing its stability. Supplied with a heavy knife block and ball-and-socket clamp with lever clamping device. An absolute, constant thickness of sections prevails even when cutting long series. Consists of two paraffin stages, large flywheel and eccentric pin which serves to move the specimen up and down, and also to advance it. The range of movement in cutting (the stroke) is approximately 45 mm. The fine adjustment of the specimen is effected automatically by a wheel with 500 teeth; the thickness of the section corresponding to one turn of the wheel is adjustable from one to 25 microns. By turning the toothed wheel, the object can be moved backward and forward at any desired speed. **Each**.................... **$175.00**

264M2 Knife Guards. For attachment by means of two clamps, for use with 264M1. **Each**.................... **$6.50**
For knives, Minot, see 264M8.
For strops, Zimmer, see page 265.

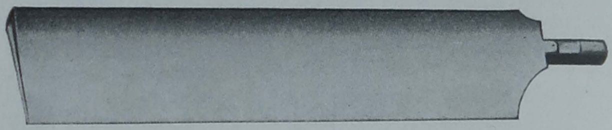
264M3 Movable Knife Blocks. To replace knife block in illustration and to permit the knife to be clamped obliquely whereby the instrument becomes available for cutting objects in celloidin. **Each**.................... **$23.00**

Microtome Accessories, Leitz

Microtome knives are furnished in three different cutting edges, as follows: (a) strongly plane-concave; (b) slightly plane-concave; (c) both surfaces plane—wedge shaped. Knives ground to style "a" are best suited for cutting celloidin. Paraffin and frozen objects are best cut with knives having style "b" or "c".



264M4



264M6

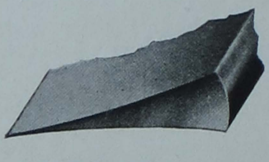
264M4 Microtome Knives. For Leitz base sledge microtome. Length, 24 cm. In case. Specify type of cutting edge. **Each**.................... **$23.00**

264M5 Handles. With screw thread. For knife 264M4. **Each**.................... **$2.25**

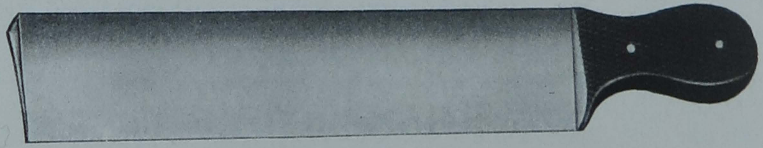
264M6 Microtome Knives. Jung pattern. With cylindrical shank. Specify type of cutting edge.

Length of cutting edge, cm.	8	12	14	16	20	24
Each, in case	**$7.50**	**11.00**	**12.00**	**13.50**	**20.00**	**21.00**

264M7 Ebony Handles. For Jung pattern knives, 264M6. **Each**.................... **$2.25**



264M8 (End View)



264M8

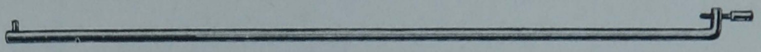
264M8 Microtome Knives, Minot. Concave on both sides; length of cutting edge, 15 cm.; back, 13 mm. thick. In case. **Each**.................... **$15.00**

264M9 Knives, Large. For hand and cylinder microtomes, plane and hollow ground. With device for fixing the handle and the blade. **Each**.................... **$5.00**

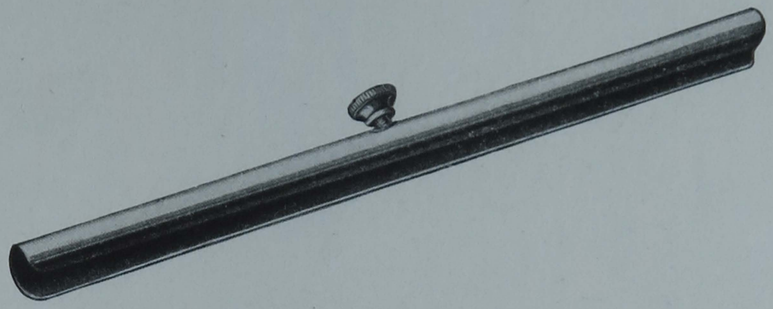
264M10 Razors. For hand and cylinder microtomes, plane and hollow ground. **Each**.................... **$2.75**

Microtome Accessories, Leitz, Continued

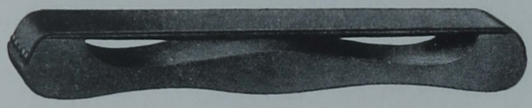
Knives of different profiles require stropping bevels of different shapes. Knives with wedge profiles and knives ground plane and hollow are to be fitted with tubular bevel attachments while deeply hollow ground knives require wire bevels. The strops must be of the correct shape and only those of best quality will serve. Belt strops are useless for microtome knives.



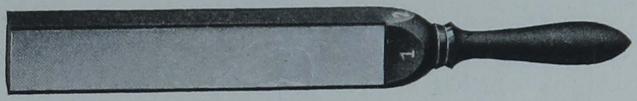
265M1



265M2



265M3



265M5

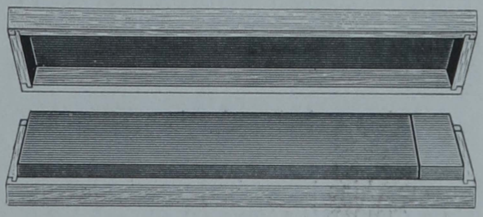
265M1 Bevels, Wire Stropping. For knives with cutting edges ground to strongly plane-concave profile.

Length, cm.	8	12	14	16	20	24
Each	**$1.00**	**1.25**	**1.50**	**1.75**	**2.00**	**2.25**

265M2 Bevels, Tubular Stropping. For knives with cutting edges slightly plane-concave, and also with both surfaces plane, wedge shaped.

Length, cm.	8	12	14	16	20	24
Each	**$1.95**	**2.25**	**2.60**	**2.60**	**3.25**	**4.25**

265M3 Strops. For microtome knives, one stropping surface only, on padded base; 30 cm. **Each**	**$3.50**
265M4 Strops. Same as 265M3, except 36 cm. long. **Each**	**$4.75**
265M5 Strops, Zimmer. Four-sided; leather on three sides; a hone on the fourth side. Length, 19 cm.; width, 3.5 cm. **Each**	**$3.50**
265M6 Strops, Zimmer. Same as 265M5, except 21 cm. long; 4 cm. wide. **Each**	**$4.75**
265M7 Paste, Stropping. Per tin	**$ .40**



265M8

265M8 Microtome Knife Hones, Yellow Belgian. Finest quality; free from grit. For first grinding. Best results are to be obtained by using palm oil soap. In wood block with cover.

Size, mm.	180x50	250x50
Each	**$5.00**	**10.00**

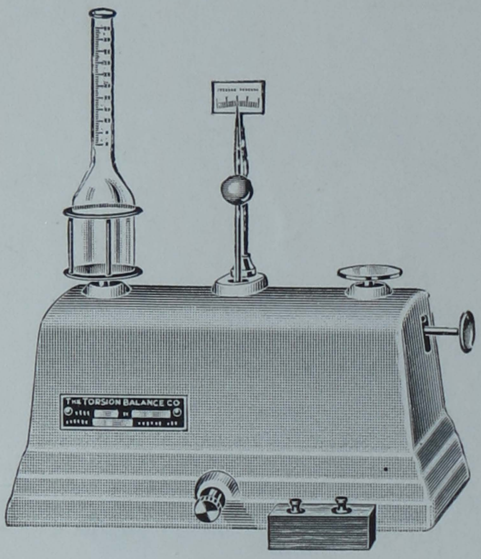
265M9 Microtome Knife Hones, Blue Green. Selected with the greatest care. Free from defects. Used for second grinding. Supplied with rubbing stone. In wood block with cover.

Size, mm.	180x50	250x50
Each	**$2.00**	**2.50**

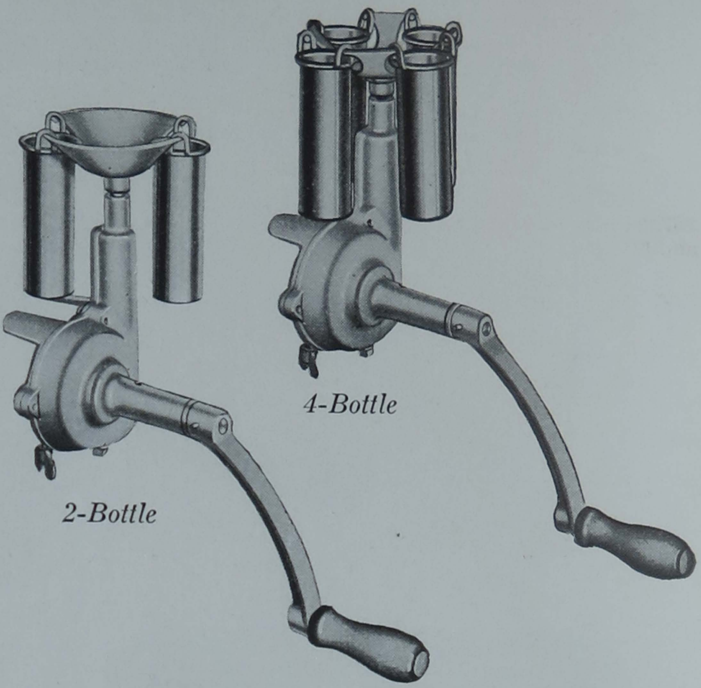
265M10 Specimen Mounting Blocks. Made of stabilite. Not affected by water or alcohol. For holding the paraffin or celloidin specimen. Neatly trimmed, with grooved surface.

Size, inches	½x½x¾	⅝x⅝x¾	¾x¾x¾	1x1x¾
Lot of 10	**$ .75**	**.80**	**.90**	**1.20**
Lot of 100	**$6.75**	**7.25**	**8.25**	**11.00**

Milk Testing Apparatus



266M1



266M2 266M3

266M1 Milk Testing Scales, Torsion. For cream test. Enclosed in white porcelain finish case to protect working parts, and provided with arresting device; no leveling screws. Bottles tared and scale leveled in one operation. Dimensions: 10½x6⅜x10¼ inches high. Sensitivity, 30 mg. Complete with one 9-gram and one 18-gram weight. Shipping weight, 17 pounds.

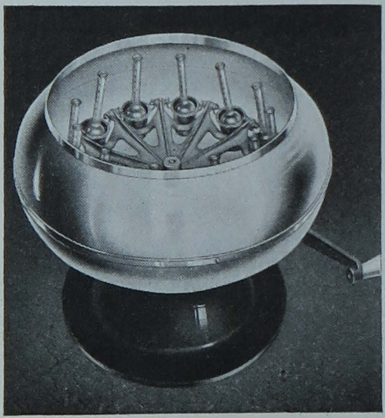
Capacity, bottles	1	2	4	12
Each	**$40.00**	**40.00**	**43.00**	**50.00**

Milk Testers, Jr. Babcock. Especially designed for individual dairymen and for traveling dairy inspectors. Machine consists of two castings forming the gear case. Gear case is oil-tight and the gears run in grease There is only one large gear and one vertical spindle, which has machine-cut spiral teeth, both made of steel. The bottle carrier, which is removably attached to the top of the spindle, is a heavily tinned malleable casting. Rotating pockets are of seamless drawn nickel-plated brass of heavy gauge, spun over and expanded in heavy pressed steel trunnions, and are secured in place in a pressed steel bottle carrier by rivets.

The seamless pockets, which swing to a horizontal position when at speed, are of the proper depth to contain hot water to submerge the bottles and keep the fat in the neck in a melted condition so that an accurate test can be made. Machine may be attached to any table or bench by means of the thumb-screw.

266M2 Milk Testers, Jr. Babcock, 2 Bottle. Shipping weight, boxed, 13 pounds. **Each**.......... **$7.50**

266M3 Milk Testers, Jr. Babcock. Same as 266M2, except 4 bottle. Shipping weight, boxed, 13 pounds. **Each**........ **$8.00**



266M4

Milk Testers, Babcock, Model A. Designed primarily to fill the need for completely dependable, up-to-the-minute machines that will give long, satisfactory service at the lowest possible price. Two models and two sizes are available, the machine being made in electric and hand-operated types, each with 8 or 12-bottle capacity.

The design and size of this model adapts it most particularly to cream station work, where a light, small capacity and at the same time durable machine is required and the investment in testing apparatus must be kept at the minimum.

266M6

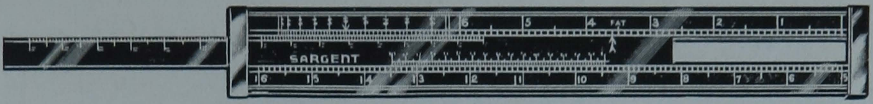
266M4 Milk Testers, Babcock, Model A, Hand Operated. Capacity, eight 6-inch bottles. Has seamless brass cups, which are easily removed. The tester is totally enclosed with lubricated worm gear drive. Cover and bowl are of polished spun aluminum; bottle carrier, cast aluminum; overall width including handle is 23 inches; overall height, 16½ inches; shipping weight, approximately 40 pounds. **Each**.......... **$26.00**

266M5 Milk Testers, Babcock, Model A, Hand Operated. Same as 266M4, except has capacity of twelve 6-inch bottles. **Each**.......... **$27.00**

266M6 Milk Testers, Babcock, Model A, Electrically Operated. Capacity, eight 6-inch bottles. With polished bowl and jet black pedestal. Cover and bowl are of polished spun aluminum; bottle carrier, cast aluminum; overall width, 18 inches; overall height, 16½ inches. Motor is 1/40 H. P., 60-cycle, 110-volt A. C. General Electric enclosed vertical type. Shipping weight, approximately 45 pounds. **Each**.......... **$35.00**

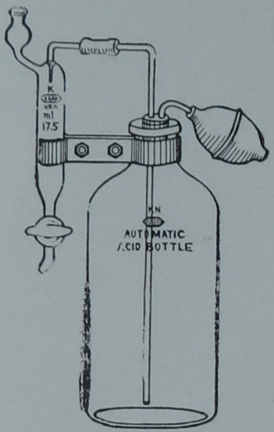
266M7 Milk Testers, Babcock, Model A, Electrically Operated. Same as 266M6, except has capacity of twelve 6-inch bottles. **Each**.......... **$36.00**

Milk Testing Apparatus, Continued



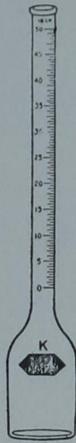
267M1

267M1 Slide Rules, Milk, Richmond. For conveniently determining the total solids in milk, from temperature, specific gravity and fat content; with temperature scale for correction of specific gravity reading Length, 12 inches. **Each**.............. **$3.50**

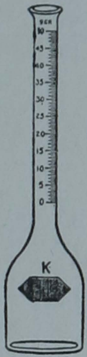


267M2

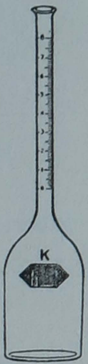
267M4



267M5



267M6



267M7

267M2 Bottles, Acid. With improved automatic detachable pipette. Delivers single charges of 17.5 ml. Complete with pipette, rubber bulb, glass vent, metal clamp and bottle. **Each**.............. **$4.00**

267M3 Pipettes, Only. For 267M2 acid bottles. **Each**.............. **$2.00**

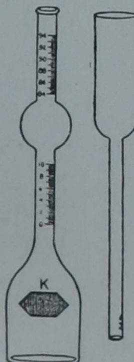
267M4 Bottles, Cream Test. Graduated to 50% in ½%. Capacity, 9 grams; length, 9 inches. **Each, $ .38. Dozen**.. **$3.80**

267M5 Bottles, Cream Test. Graduated to 50% in ½%. Capacity, 18 grams; length, 9 inches. **Each, $ .38. Dozen**.. **$3.80**

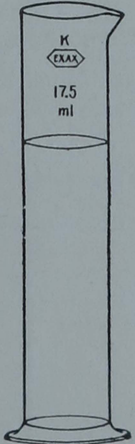
267M6 Bottles, Cream Test. Graduated to 50% in ½%. Capacity, 9 grams; length, 6 inches. **Each, $ .32. Dozen**.... **$3.20**

267M7 Bottles, Milk Test. Graduated to 8% in ⅒%. Capacity, 18 grams; length, 6½ inches. **Each, $ .28. Dozen**... **$2.80**

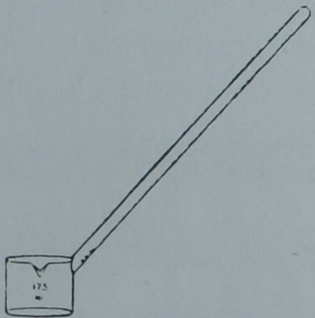
Milk Hydrometers (Lactodensimeter), see page 223.
Milk Thermometers (Floating Dairy), see page 382.



267M8



267M9



267M10

267M8 Bottles, Butter Test, Wright. For testing moisture and overrun. Graduated to 94% in ⅕%. Capacity, 9 grams; length, 6 inches. Complete with funnel. **Each, $ .68. Dozen**.............. **$6.80**

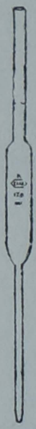
267M9 Cylinders, Acid.

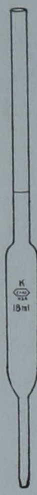
Capacity, ml.	9	17.5
Each	**$ .16**	**.17**
Dozen	**$1.60**	**1.70**

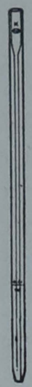
267M10 Dippers, Acid. Made of heavy glass with extra strong handle.

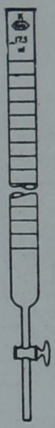
Capacity, ml.	9	17.5
Each	**$ .40**	**.41**
Dozen	**$4.00**	**4.10**

Milk Testing Apparatus, Continued


268M1


268M2


268M3


268M4

268M1 Pipettes, Milk Test. Contains 17.6 ml. **Each, $ .30. Dozen** $3.00

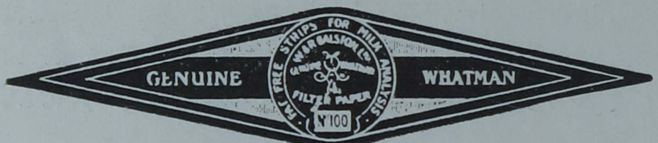
268M2 Pipettes, Cream Test.

Capacity, ml.	9	18
Each	$ .28	.30
Dozen	$2.80	3.00

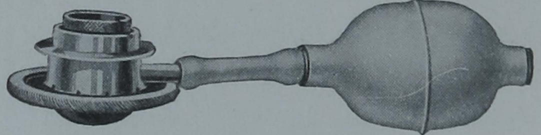
268M3 Pipettes, Exax Blue Line, Breed and Brew. Capillary without bulb. Capacity, 0.01 ml. Calibrated to deliver 0.01 ml. of milk. Specific gravity 1.032, at 21° C. **Each** .... $ .70

268M4 Burettes, Acid. With straight stopcock. Calibrated to deliver charges of 17.5 ml.

Number of charges	12	25
Each	$3.50	4.00



268M5

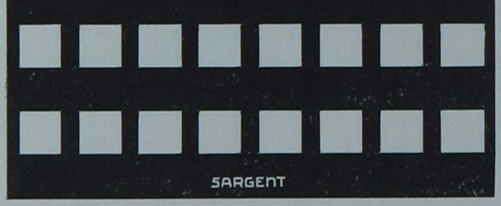

268M6

268M5 Strips, Whatman Milk Analysis No. 100. Size, 58x6.25 cm. **Package** of 50, **$2.75. Package** of 100 .... $5.20

268M6 Milk Sediment Testers, Wizard Type. Will filter a pint of milk in a few seconds, and collect the dirt on a standard size cotton disc filter. The milk is forced through the filter by pressure from a bulb at the side. Complete with 500 cotton filters. Weight, approximately 2 pounds. **Each** $6.50

268M7 Cotton Filter Discs. One inch diameter. For 268M6. **Thousand** $2.00

268M8 Cotton Filter Discs. 1¼ inch diameter. For other types of sediment testers. **Thousand** $2.50



268M9

268M10

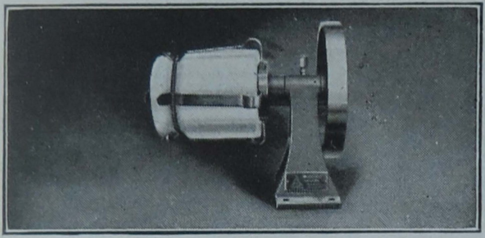
268M9 Guide Cards, Milk Bacteria, Breed and Brew. A. P. H. A. Consists of a black card 2x4½ inches, divided with 16 white squares each 1 square cm. in area. This card is placed under the microscope slide of corresponding size to assist in preparing milk smears of correct area for microscopic counting. It should be used in connection with 268M10 milk slide. **Each** . $ .10

268M10 Microscope Slides, Milk Bacteria, Breed and Brew. A. P. H. A. Accommodates a large number of samples of milk smears as recommended by the A. P. H. A. Made of optically plane glass, 2x4½ inches in sizes with ground margins in the longer direction for labeling. **Each** .... $ .15

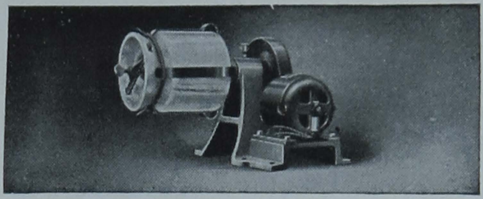
Mills, Abbe Ball, Porcelain Jar

Mills, Abbe Ball, Porcelain Jar. For pulverizing and mixing hard and soft crushed materials to the desired fineness, in dry form or with a liquid vehicle. Jars and covers are of porcelain with covers individually ground to fit and provided with a thin gasket of pure gum rubber. Covers are locked into the jars by means of a crossbar with a central thumbscrew held in loops connected to a neckband surrounding the throat of the jar. Each jar is supplied with an ample charge of selected flint pebbles.

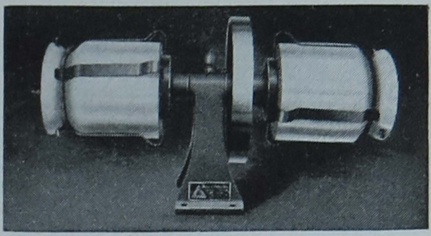
Mills are equipped with either pulley or direct motor drive. Motor driven units operate on 110-volt, single phase A. C. Motors with other current characteristics can be supplied. Prices on application.



269M1 1 Jar



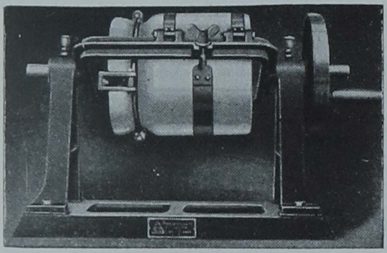
269M2 1 Jar



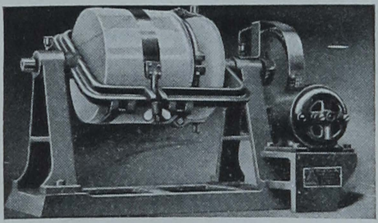
269M1 2 Jars

Mills, Specimen, Abbe Ball, Porcelain Jar. Jars are held by four jaws of spring steel and locked by a coilspring at the neck. Outside dimensions of jar, 5.2x5.71 inches. Charging capacity: wet, 1 pint; dry, ⅓ quart. Operating speed, 100 to 120 R. P. M. Size of pulley, 9x1 inch.

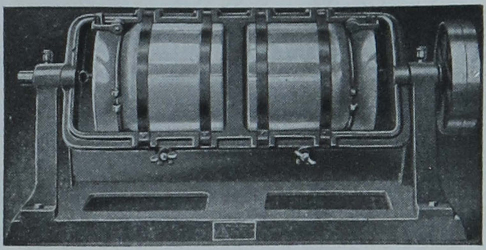
Number of jars	**1**	**2**	**5**
Floor space, inches, pulley drive	9x11	9x19	16x20
Floor space, inches, motor drive	15x18	18x20	20x22
Height, inches	12	12	18
Weight, shipping, pounds, pulley drive	40	50	150
Weight, shipping, pounds, motor drive	85	100	200
Pebbles supplied, pounds	2	4	10
Horsepower required	⅙	⅙	⅙
269M1 Mills. With pulley drive. **Each**	**$23.00**	**36.00**	**115.00**
269M2 Mills. With motor drive. **Each**	**$84.00**	**97.00**	**195.00**



269M3 1 Jar



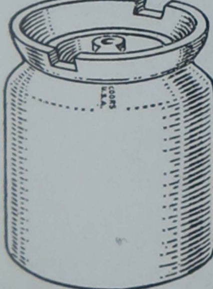
269M4 1 Jar



269M3 2 Jars

Mills, Assay, Abbe Ball. Porcelain Jar. Jars rest on two strong brass straps rigidly fastened to cast iron cradle arms, and locked fast by a hinged brass strap on opposite side. Mills are revolved on machined trunnions. Bearings are self-aligning, supported on stands rigidly fastened to welded, rolled steel bedplates. Outside dimensions of jar, 8.75x9.65 inches. Charging capacity: wet, 2⅓ quarts; dry, 3 pints. Operating speed, 65 to 75 R. P. M. Size of pulley, 9x1 inch.

Number of jars	**1**	**2**	**3**	**4**
Floor space, inches, pulley drive	15x23	15x35	15x48	15x37
Floor space, inches, motor drive	20x25	20x36	20x50	27x40
Height, inches	19	19	19	37
Weight, shipping, pounds, pulley drive	100	150	225	350
Weight, shipping, pounds, motor drive	150	200	250	500
Pebbles supplied, pounds	8	16	24	32
Horsepower required	⅙	⅙	⅙	½
269M3 Mills. With pulley drive. **Each**	**$ 45.00**	**78.00**	**105.00**	**155.00**
269M4 Mills. With motor drive. **Each**	**$126.00**	**157.00**	**195.00**	**250.00**



269M5

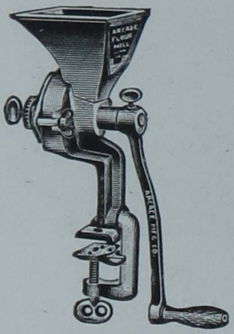
269M5 Mill Jars, Ball. With ground-in cover, glazed inside and outside with exception of outside bottom surface.

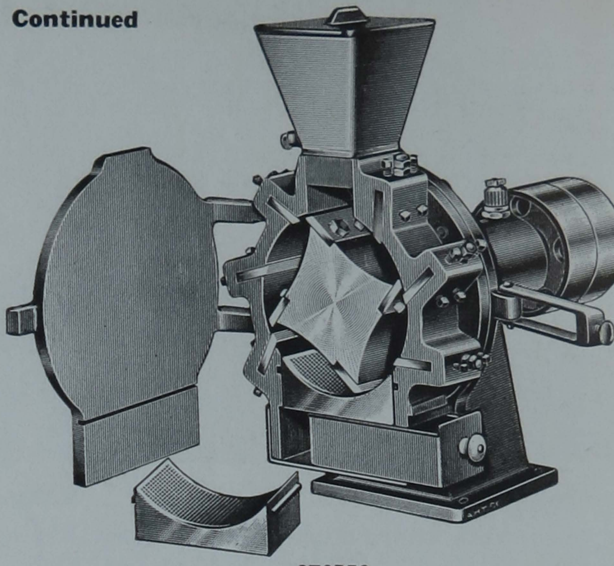
Size number	**2**	**3**
Diameter, inches	5.2	8.75
Height, inches	5.71	9.65
Capacity, ml.	1000	5250
Complete with cover, but without sealing device	**$5.00**	**15.70**
269M6 Covers, Only. For 269M5. **Each**	**$1.50**	**4.75**
269M7 Sealing Devices, Bronze. For 269M5. **Each**	**$ .45**	**2.00**

269M8 Mill Pebbles, Flint. Pure amorphous flint.

Diameter, inches	**1**	**1⅜**	**1⅝**	**1¾**	**2⅜**	**2⅞**	**3¾**
Number to a pound	33	11	6	4	2	1	1-1½
Pound	**$ .15**	**.15**	**.15**	**.15**	**.15**	**.15**	**.15**

Mills, Continued


270M1

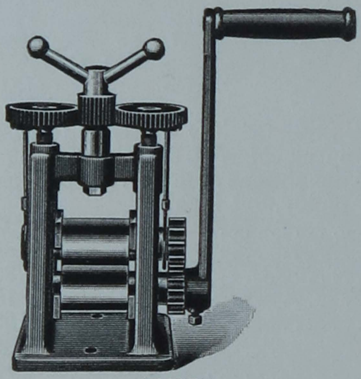

270M2

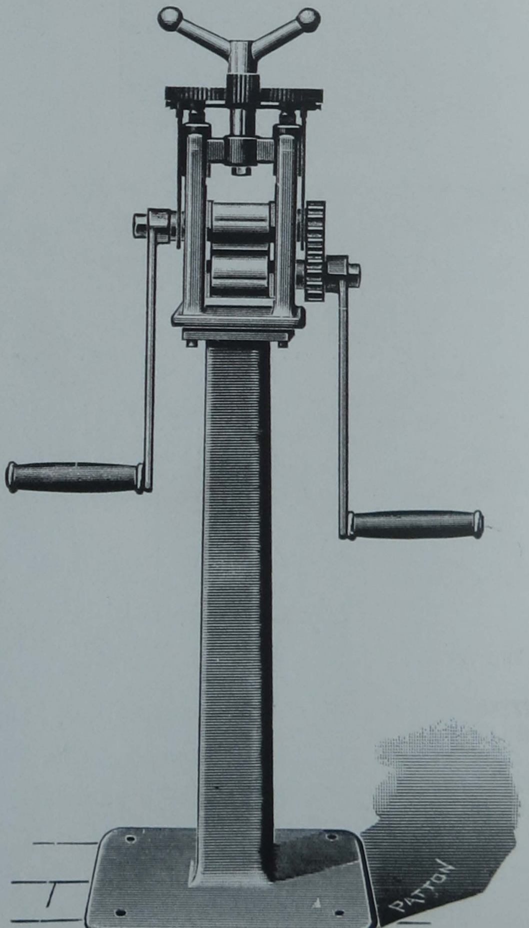
270M1 Mills, Grinding, Hand Operated. For grinding grain, wet or dry. Grinding burrs are adjustable and all parts are made of heavy cast iron and steel, except the wood handle grip. Overall height, 13½ inches; width, 5½ inches; extreme depth, 12 inches; length of crank, 10 inches. **Each** $3.50

270M2 Mills, Grinding, Wiley, Laboratory. For the preparation of most materials other than mineral ores for laboratory analysis. Four knives on a revolving shaft work with a shearing action against six which are set in the frame. Overall height, 21 inches;floor space, 14x20 inches; sample drawer 7x3x2¼; pulleys, 6 inches in diameter x2½ inches face. Mill should be operated at from 400 to 800 R. P. M. and requires from ½ to 1 H. P. Complete with three sieves of ½ mm., 1 mm., and 2 mm. mesh, respectively, with tight and loose pulleys for belt drive. Shipping weight, 210 pounds. **Each** $195.00

270M3 Mills, Grinding, Wiley, Laboratory. Same as 270M2, except with directly connected electric motor, base and equipment for use on 110 volts, 3-phase, 60-cycle, A. C. Floor dimensions 42x19½ inches. Shipping weight, 575 pounds. **Each** . $450.00

270M4 Mills, Grinding, Wiley, Laboratory. Same as 270M3, except for 220 volts, 3-phase, 60-cycle, A. C. motor. **Each** $450.00


270M5



270M6

270M5 Mills, Hand Rolling, Crown. With flat rolls made of crucible steel, hardened, ground and polished. Dimensions, 2 inches in diameter by 3 inches long. The rolls can be removed quickly from the frame. The pinions are cut from steel bar. Net weight, 45 pounds, shipping weight, 54 pounds. **Each** $42.00

270M6 Mills, Hand Rolling, Single Geared. On stand. The roll pinions are mounted directly on two flat rolls which revolve in bronze bearings of ample size to insure long life and to prevent their being crushed by the strain imposed upon them by the pressure screws. The rolls are made from tool steel, properly heat treated to give a tough core and very hard surface; dimensions, 2¼ inches in diameter by 3 inches long. Hardened cylindrical blocks are embedded in the bearings to prevent their wear by the pressure screws. The gears are cut from solid bar steel. The cranks are made of malleable iron to give them strength. Floor space, 15 by 25 inches. Net weight, 113 pounds; shipping weight, 165 pounds. **Each** $67.50

Mineral Collections

271M1

271M2

271M1 Mineral Collections, Diamond. For making comparison tests to identify unknown minerals. Consists of a collection of fifty specially selected specimens of typical metallic and non-metallic minerals which average about an inch through. Each piece bears a number corresponding to a list on the lid of the box for identification. The collection is contained in a wooden box, divided into fifty compartments, the dimensions of which approximate 11¾x6x1⅝ inches.

1. Sulphur
2. Stibnite
3. Graphite
4. Gold Quartz
5. Ruby Silver
6. Cinnabar
7. Chalcopyrite
8. Cuprite
9. Malachite
10. Azurite
11. Galenite
12. Cerussite
13. Sphalerite
14. Smithsonite
15. Calamite
16. Cassiterite
17. Pyrite
18. Pyrrhotite
19. Hematite
20. Magnetite
21. Limonite
22. Siderite
23. Pyrolusite
24. Cryolite
25. Corundum
26. Bauxite
27. Chromite
28. Wolframite
29. Calcite
30. Dolomite
31. Fluorite
32. Gypsum
33. Apatite
34. Phosphate Rock
35. Magnesite
36. Rock Crystal
37. Milky Quartz
38. Amethyst
39. Chalcedomy
40. Agate
41. Jasper
42. Orthoclase
43. Pyroxene
44. Amphibole
45. Garnet
46. Muscovite
47. Serpentine
48. Talc
49. Barite
50. Celestite

Complete in wooden box. **Each** **$5.50**

271M2 Mineral Collections. For identification of unknown minerals by comparison. The collection consists of the following minerals and rocks, each accurately labeled and in a separate compartment of a neat cloth-covered case:

Minerals

1. Graphite
2. Galena
3. Sphalerite
4. Chalcopyrite
5. Pyrite
6. Fluorite

Minerals

7. Quartz, massive
8. Quartz, crystallized
9. Hematite
10. Magnetite
11. Limonite
12. Calcite
13. Siderite

Minerals

14. Orthoclase, Potash Feldspar
15. Amphibole, Hornblende
16. Amphibole, Asbestos
16. Garnet
18. Muscovite
19. Talc
20. Gypsum

Rocks

21. Conglomerate
22 Sandstone, Friable
23. Sandstone, Red
24. Potters Clay
25. Shale
26. Calcareous Tufa
27. Limestone, Oolitic

Rocks

28. Limestone, Fossiliferous
29. Limestone, Compact
30. Peat
31. Lignite
32. Basalt
33. Granite
34. Diabase

Rocks

35. Gneiss
36. Micaschist
37. Quartzite
38. Clay Slate
39. Marble
40. Residuary Sand

Complete in cloth-lined case. **Each** **$6.00**

271M3 Mineral Collections, with Unlabeled Specimens. Otherwise, same as 271M2, containing all of the minerals and rocks of that collection. **Complete** **$1.00**

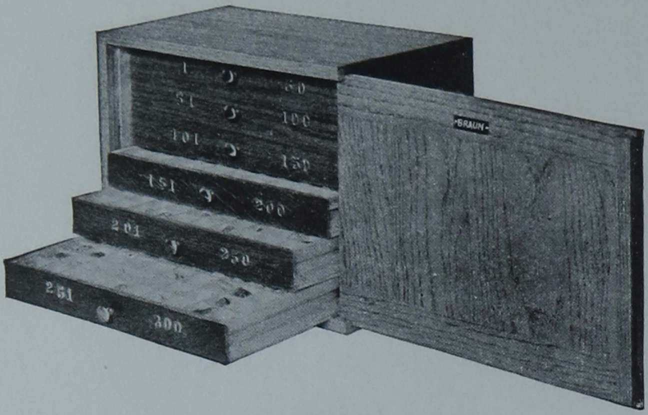
271M4 Mineral Hardness Test Sets. Provides for a more exact identification of various types of minerals than is possible by comparison alone. The set includes a file, cold chisel and porcelain streakplate for making various tests.

The test specimens included are:

1. Talc
2. Selenite
3. Calcite
4. Fluorite
5. Apatite
6. Orthoclase
7. Quartz
8. Topaz
9. Corundum

Complete in box. **Each** **$4.50**

Mineral Collections, Continued



272M1

272M2

272M1 Mineral Collections, Student. Comprises 300 specimens averaging 1x1 inch in size. In neat oak cabinet, with six drawers of fifty compartments each, with door. Dimensions, 12x8¾x7¼ inches. The collection includes:

- Acidic Division
  - Sulphur Group (2)
  - Boron Group (1)
  - Arsenic Group (7)
  - Carbon Group (2)

- Basic Division
  - Gold (1)
  - Silver (9)
  - Platinum (1)
  - Mercury (1)
  - Copper (15)
  - Lead (8)
  - Zinc (6)
  - Cadmium (1)
  - Tin (3)

- Basic Division, Continued
  - Titanium (3)
  - Cobalt and Nickel (8)
  - Uranium (2)
  - Iron (25)
  - Manganese (10)
  - Aluminum (16)
  - Cerium, Yttrium, etc. (2)
  - Magnesium (5)
  - Calcium (26)
  - Barium and Strontium (4)
  - Sodium (1)

- Silica and Silicates
  - Quartz (20)
  - Opal (6)

- Anhydrous Silicates
  - Bisilicates (19)
  - Unisilicates (37)
  - Subsilicates (13)

- Hydrous Silicates
  - General Section (5)
  - Zeolite Section (7)
  - Margarophylite Section (23)

- Hydrocarbon Compounds
  - Simple Hydrocarbons (1)
  - Oxygenated Hydrocarbons (1)
  - Asphaltum and Mineral Coals (9)

Complete in Oak Cabinet. Each...**$82.50**

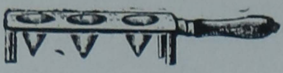
272M2 Mineral Collections, Massco. For the identification of unknown minerals by comparison with selected specimens. Consists of 100 select specimens of the principal minerals and rocks, each of which are about one inch square in size and neatly packed in a 100-compartment oak case. Each compartment is numbered and a list is furnished giving name and composition of each specimen.

The collection is composed of the following:

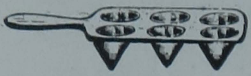
1. Malachite
2. Hematite
3. Rutile
4. Willemite
5. Hornblende
6. Epidote
7. Talc, Steatite
8. Amphibole
9. Serpentine, Chrysotile or Asbestos
10. Anhydrite
11. Franklinite
12. Gypsum
13. Tourmaline, Black
14. Wurtzilite
15. Hubnerite
16. Tourmaline, Brown
17. Chrysocolla
18. Realgar
19. Jamesonite
20. Alunite
21. Limestone
22. Bornite
23. Limonite
24. Porphyry
25. Magnetite
26. Witherite
27. Carnotite
28. Cinnabar
29. Cryolite
30. Albite
31. Enargite
32. Sepiolite
33. Corundum
34. Pyrolusite
35. Calcite
36. Sphalerite
37. Garnierite
38. Halite
39. Fluorite
40. Calamine
41. Graphite
42. Lepidolite
43. Apatite
44. Galena
45. Siderite
46. Ilmenite
47. Cerussite
48. Gypsum, Satin Spar
49. Serpentine
50. Microcline
51. Manganite
52. Chalcopyrite
53. Cervantite
54. Allophane
55. Rhodonite
56. Marcasite
57. Columbite
58. Pyrrhotite
59. Oil Shale
60. Magnesite
61. Rhodochrosite
62. Molybdenite
63. Kaolinite
64. Garnet
65. Zincite
66. Cassiterite
67. Stannite
68. Chalcocite
69. Bismuthinite
70. Smithsonite
71. Arsenopyrite
72. Ferberite
73. Scheelite
74. Celestite
75. Crocolite
76. Phosphate Rock
77. Dolomite
78. Chromite
79. Pyrite
80. Talc, Foliated
81. Opal
82. Bauxite
83. Stibnite
84. Argentite
85. Pumice
86. Calcite
87. Strontianite
88. Barite
89. Beryl
90. Glaucodot
91. Cuprite
92. Niccolite and Smaltite
93. Wolframite
94. Sylvite
95. Martite
96. Tripoli
97. Micaceous Specular Iron
98. Wulfenite
99. Mica
100. Sylvanite

Complete in Oak Case. Each...**$10.00**

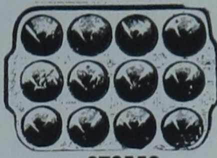
Molds



273M1



273M2



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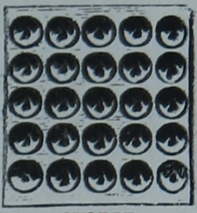


273M5

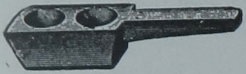
273M1 Molds, Slag, Iron, with 3 Conical Cups and Wood Handle. For crucible or scorification assays. Each cup is 2 inches in diameter; 1⅜ inches deep. Overall size, 2¾x8 inches. Weight, 2 pounds. **Each**........**$1.00**

273M2 Molds, Slag, Iron, with 6 Conical Cups. For crucible or scorification assays. Each cup is 2 inches in diameter; 1½ inches deep. Overall size, 5x7½ inches. Weight, 3 pounds. **Each**........**$1.00**

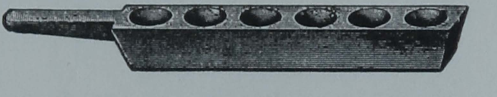
273M3 Molds, Slag, Iron, with 12 Conical Cups. For crucible or scorification assays. Each cup is 2⅛ inches in diameter, 1 inch deep. Overall size, 7x10½ inches. Weight, 5 pounds. **Each**........**$1.25**

273M4 Molds, Slag, Iron, with 12 Large Conical Cups. For crucible or scorification assays. Each cup is 3 inches in diameter, 1½ inches deep. Overall size, 10x14½ inches. Weight, 11 pounds. **Each**........**$2.50**

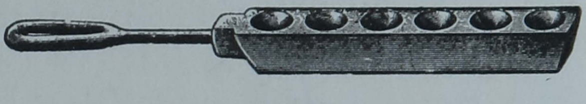
273M5 Molds, Slag, Iron, with 25 Round Bottom Cups. For scorification assays. Each cup is 1¾ inches in diameter, ½-inch deep. Overall size, 9x10 inches. Weight, 5 pounds. **Each**........**$1.25**



273M6



273M7

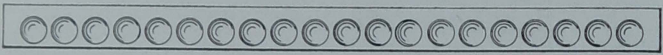


273M8

273M6 Molds, Slag, Iron, with 2 Machined Conical Cups. For crucible or scorification assays. Each cup is 2¼ inches in diameter, 1½ inches deep. Overall size, 3x5 inches. Weight, 6 pounds. **Each**........**$2.00**

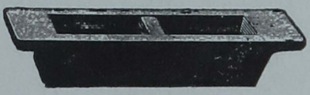
273M7 Molds, Slag, Iron, with 6 Machined Conical Cups. For crucible or scorification assays. Each cup is 2¼ inches in diameter and 1¼ inches deep. Overall size, 3x15 inches. Weight, 15 pounds. **Each**........**$3.00**

273M8 Molds, Slag, Iron, with 6 Machined Conical Cups and Ring Handle. For crucible or scorification assays. Handle screws into mold and is detachable. Each cup is 2¼ inches in diameter, 1¼ inches deep. Overall size, 3x16¼ inches. Weight, 13 pounds. **Each**........**$3.50**

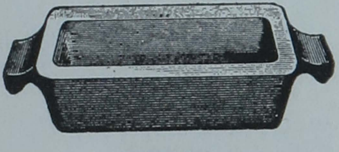


273M9

273M9 Molds, Lead Button. Used in the decanting method of pouring the assay fusion. After the slag is poured off, the lead is poured into this button mold. Made of steel with 20 cups large enough for 40-gram lead buttons. **Each**....**$4.00**



273M10



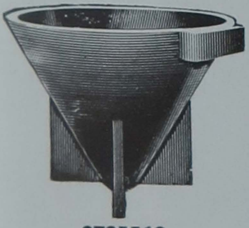
273M11

273M10 Molds, Bullion, Iron. Ingot or bullion mold. With sliding bar to cast various sizes. Inside dimensions, 1½x1½x8 inches. Capacity, 150 ounces gold, 75 ounces silver. **Each**........**$2.50**

273M11 Molds, Bullion, Iron. Ingot or bullion mold. Capacity of mold is figured filled within about 3/16-inch of top.

Capacity, gold, ounces	**20**	**50**	**100**	**250**	**500**	**1000**	**2000**	**2500**	**5000**
Capacity, silver, ounces	10	25	56	140	275	550	1100	1350	3000
Length, inches	3½	3½	4	5½	6½	9	11	11½	15
Width, inches	1	1½	2	2½	3¼	3¾	4¾	5¼	7
Depth, inches	1	1½	2	2½	3¼	3¾	4¾	4½	6
Each	**$1.10**	**1.75**	**2.00**	**3.00**	**3.25**	**5.00**	**7.00**	**9.00**	**12.00**

273M12 Lettering on 273M11 Molds can be furnished when desired. Price per letter, **extra**........**$ .15**



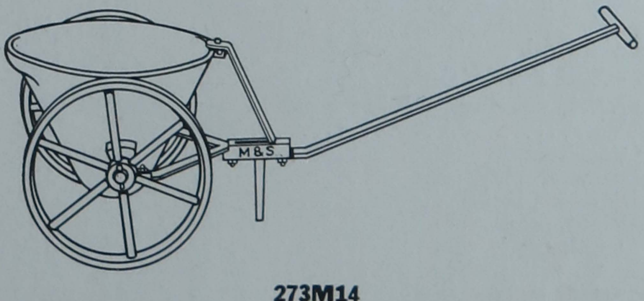
273M13

273M13 Molds, Pouring, Iron. For black lead and Tercod crucibles.

For crucible, number	**6**	**10**	**16**	**25**	**35**	**50**	**80**	**100**	**125**	**150**
Diameter, inches	7½	9½	10¾	12½	14	15¼	17¼	19½	19½	22
Height, inches	6	7½	9	10½	12	11	13	15	15	17
Weight, pounds	16	27	35	50	60	85	105	135	135	170
Each	**$2.50**	**4.00**	**5.00**	**6.50**	**7.50**	**10.00**	**12.00**	**15.00**	**15.00**	**17.00**

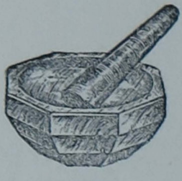
273M14 Molds, Pouring, Iron, on Wheels. Similar to 273M13, except on two wheels with iron handle.

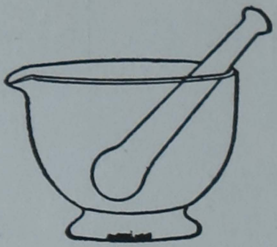
Capacity, cubic feet	**1¼**	**1¾**	**2½**
Diameter, inside, inches	19⅛	23¼	26½
Depth, inches	13	16	19
Height, overall inches	22	24	27⅝
Weight, pounds	400	500	725
Each	**$65.00**	**80.00**	**110.00**



273M14

Mortars


274M1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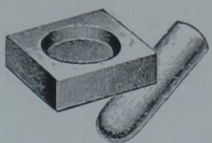
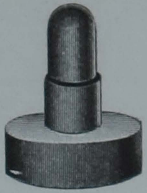
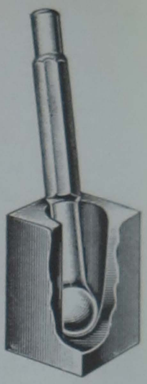

274M4


274M5


274M6

274M1 Mortars, Agate. With agate pestles.

Diam., in.	1.5	2	2.5	3	3.5	4	4.5	5
Each, with pestle	**$3.00**	**3.50**	**6.00**	**8.00**	**13.00**	**16.00**	**20.00**	**27.00**

274M2 Mortars, Glass. With pestle.

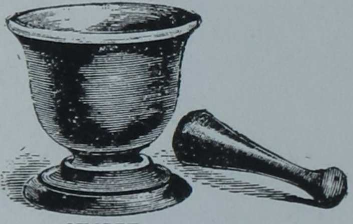
Capacity, ounces	**1**	**2**	**4**	**8**	**16**	**32**
Diameter, inches	2.7	3.2	4.1	4.4	5.4	6.2
Each, with pestle	**$ .40**	**.45**	**.60**	**.70**	**1.10**	**1.50**
274M3 Pestle, Only	**$ .22**	**.25**	**.33**	**.38**	**.60**	**.85**

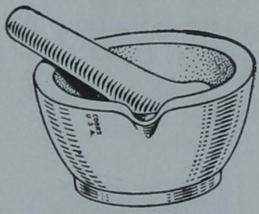
274M4 Mortars, Leeds, Diamond. Made of tool steel. Diameter of depression, 22 mm. With pestle. **Each . . $4.00**

274M5 Mortars, Plattner's, Diamond. Hardened steel. With pestle. For crushing small quantities of ore and for flattening silver buttons.

Diameter, cavity, inches	**.75**	**1.2**
Depth cavity, inches	.25	.37
Diameter mortar, inches	2	3
Each	**$5.50**	**8.50**

274M6 Mortars, Large. Heat-treated tool steel. With pestle. Pestle has octagonal handle. Size of mortar, 3x3x4½ inches. Top diameter of cylindrical cavity, 2 inches. Depth of cavity, 3 inches. Length of pestle, 9¾ inches. **Each . . . $30.00**


274M7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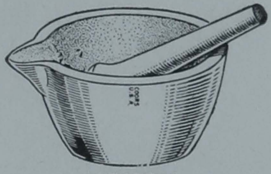
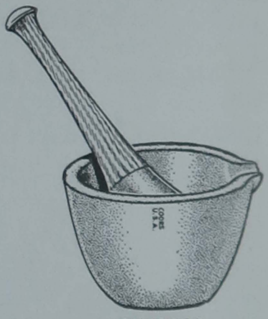

274M11


274M13

274M7 Mortars, Iron, High Form. With pestle.

Capacity, pints	**½**	**1**	**2**	**4**	**8**	**16**	**24**
Diameter, inches	3¾	5	5½	7	8¼	11	12
Weight, pounds	3	5	7	12	17	32	46
Each, with pestle	**$ .90**	**1.00**	**1.50**	**2.00**	**4.00**	**6.00**	**10.00**
274M8 Pestles, Only	**$ .25**	**.30**	**.40**	**.50**	**.80**	**1.25**	**2.50**

274M9 Mortars, Coors Porcelain. With lip, glazed outside, with pestle glazed to grinding surface.

Size	**0**	**0A**	**1**	**2**	**3**	**4**	**5**	**6**
Capacity, ml	60	90	135	275	400	750	1900	4000
Diameter, mm	70	80	90	115	130	160	210	283
Diameter, inches	2.8	3.2	3.6	4.6	5.2	6.4	8.4	11.3
Height, mm	42	48	58	70	80	100	130	150
Length, pestle, mm	110	130	135	170	190	220	240	260
Each, with pestle	**$ .39**	**.57**	**.66**	**1.00**	**1.50**	**2.80**	**4.95**	**7.25**
274M10 Pestle, Only	**$ .13**	**.13**	**.23**	**.35**	**.56**	**1.00**	**1.32**	**1.95**

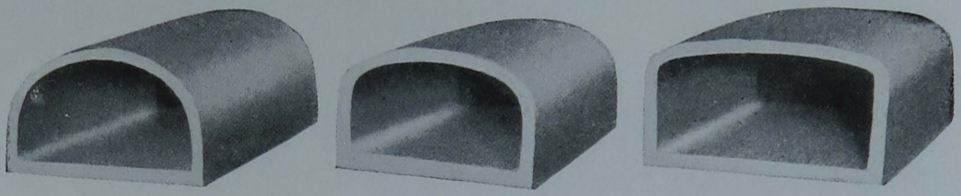
274M11 Mortars, Coors Porcelain, Flat Shallow Form. With lip. With short pestle. Sizes 6 to 12, inclusive, have pestles with wooden handles.

Size	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Capacity, ml	50	100	150	200	300	500	1000	1250	1500	3000	4000	6000	9000
Diameter, mm	70	82	100	121	140	158	210	230	241	265	305	355	405
Diameter, inches	2.8	3.2	4	5	5.5	6.2	8.2	9	9.5	10.5	12	14	16
Height, mm	43	50	54	62	72	72	92	95	95	105	120	145	180
Length, pestle, mm	100	100	120	140	160	190	245	254	270	310	330	360	450
Each, with pestle	**$ .39**	**.57**	**.72**	**1.05**	**1.45**	**1.90**	**3.00**	**3.30**	**4.15**	**4.65**	**10.20**	**14.00**	**24.75**
274M12 Pestle, Only	**$ .13**	**.13**	**.23**	**.35**	**.38**	**.56**	**.88**	**1.00**	**1.20**	**1.60**	**1.90**	**2.70**	**3.25**

274M13 Mortars, Coors Porcelain, Wedgewood. Entirely unglazed. With pestles having wooden handles.

Size	**0000**	**000**	**00**	**0**	**1**	**2**	**3**	**4**	**5**	**7**	**9**	**12**
Capacity, ml	60	100	150	165	300	415	770	1185	1650	2840	4730	8050
Diameter, mm	82	90	100	115	127	140	162	186	206	248	287	342
Diameter, inches	3.2	3.5	4	4.5	5	5.5	6.3	7.3	8.2	9.7	11.4	13.5
Height, mm	54	56	64	70	73	86	98	105	118	130	150	178
Length Pestle, mm	127	127	150	158	178	185	203	238	254	292	330	370
Each, with pestle	**$1.05**	**1.10**	**1.25**	**1.38**	**1.50**	**1.65**	**2.20**	**2.70**	**3.30**	**4.50**	**7.70**	**12.20**
274M14 Pestle, Only	**$ .38**	**.38**	**.42**	**.46**	**.50**	**.55**	**.73**	**.88**	**1.00**	**1.50**	**1.95**	**2.60**

Muffles, Silcar



Shape 2 Shape 3 Shape 4

275M1

275M1 Muffles, Silcar. Produced from selected silicon carbide which does not melt at any temperature under about 4060° F. The high thermal conductivity of silcar muffles, about 10 times as great as fire clay muffles, provides for a more uniform distribution of heat and lowered fuel consumption. High compressive strength and resistance to abrasion, approximately 12 times that of fire clay, coupled with a very low coefficient of expansion enables the muffle to carry a heavy load of crucibles with minimum danger from uneven supports and reduces the danger of damage from direct flame encountered with gas or oil burners.

In addition to the muffles listed below, muffles made to suit special specifications or requirements can be supplied.

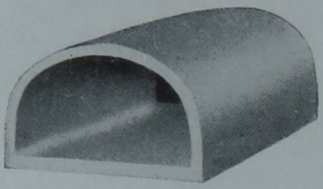
In ordering, please specify the designating letter. When ordering special muffles be sure to give complete information and dimension sketch.

	Outside Dimensions						Inside Dimensions			
Muffle Number	Width Inches	Length Inches	Height Inches	Shape	Vents	Net Weight Pounds	Width Inches	Center Height Inches	Side Height Inches	**Each**
CC	4¾	8	3	2	⅝"x1½" slot rear end	6	4	2¼	....	**$3.75**
F	6	10	4	2	½"x1" slot rear end	7	5¼	3⅛	....	**5.20**
CJ	6	12	4	3	¾"x2" slot rear end	9	5⅛	3⅛	....	**5.40**
J	6	12½	4	2	7/16"x1¾" slot rear end	8	5⅜	3½	....	**8.00**
A-4	7½	12½	4⅝	2	½"x3" slot in rear end	10	6⅝	3¾	....	**6.25**
GK	8	12	5¼	4	2" diameter hole in top	12	7⅜	4⅜	3⅞	**6.80**
LL	9	15	5¾	3	¾"x2½" slot rear end	15	7⅞	4½	2¾	**11.25**
II	10	16	6¾	3	1⅝" diameter hole rear end	27	8½	5⅜	3⅛	**11.20**
GI	10¼	16	6	4	2¼" diameter hole in top	21	9	5	3¾	**11.45**
NN	10¼	19	6 7/16	3	Two 1" diameter holes in rear end	33	9	5 1/16	3¾	**14.45**
NNO	10¼	19	6 7/16	3	2" diameter hole in top	33	9	5 1/16	3¾	**14.45**
LM	10¼	22	6¼	3	¾"x2½" slot rear end	41	9	5	3⅝	**14.25**
RR	10½	21	6½	3	Two 1" diameter holes rear end	41	8¾	5	3⅝	**15.70**
LD	10¾	16	6	4	2" diameter hole in top	30	9½	4¾	3¾	**11.80**
LF	12⅛	20½	7¾	3	2½" diameter hole in top	40	10⅞	6½	4½	**18.55**
LF Special	12⅛	20½	7¾	3	Two 1" diameter holes rear end	40	10⅞	6½	4½	**18.55**
QQQ	12¼	18	7¾	3	Two 1" diameter holes rear end	40	11	6⅜	3⅝	**16.50**
QQ	12¼	19	7¾	3	Two 1" diameter holes rear end	34	11	6⅜	3⅝	**17.00**
QQO	12¼	19	7¾	3	2½" diameter hole in top	34	11	6⅜	3⅝	**16.05**
USQQ	12¼	21	7¾	3	Two 1" diameter holes rear end	40	11	6⅜	3⅝	**17.15**
A-6	13⅛	14¾	6½	3	¾"x6" slot rear end	28	12	5¼	3½	**13.10**
GU	14	18	6½	4	3" diameter hole in top	40	12¾	5⅛	4	**16.80**
UUU	14	19	9¾	3	Two 1¼" diameter holes rear end	50	12¾	8⅛	5¾	**19.75**
S-143	14¼	22½	7⅝	3	Two 1" diameter holes rear end	45	13	6	4	**20.05**
SR-2	14½	18	7	4	3" diameter hole top	43	13¼	5⅝	4½	**20.00**
UU	14½	19	7 5/16	3	Two 1¼" diameter holes rear end	48	12¾	5 11/16	3⅝	**15.75**
VA	14½	19	9	3	Two 1¼" diameter holes rear end, and a ledge along inside walls	63	13	7½	5	**21.50**
LG	14½	20½	7	4	2½" diameter hole in top	55	13	5½	4	**21.25**
VV	14⅝	19	7¾	3	Two 1" diameter holes rear end	43	13½	6½	3¾	**19.90**
TXX	16	24	9¼	3	Two 1⅛" diameter holes rear end	75	14½	7½	5	**23.70**
LJ	17¼	25	9⅛	3	2½" diameter hole in top	100	15¼	7⅜	5	**28.15**
S-173	17½	23	9	3	3" diameter hole in top	75	15¾	7⅛	4¾	**28.40**

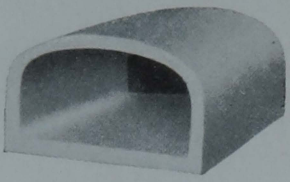
275M2 Muffle Cement, Silcarite, No. 7C. For luting and plastering muffles. Recommended because of its negligible shrinkage upon heating, its high melting point, and the close conformity of its chemical composition and physical characteristics to those of silcar.

In bags containing pounds	1	5	10	25	100
Pound	**$ .30**	**.26**	**.24**	**.21**	**.17**

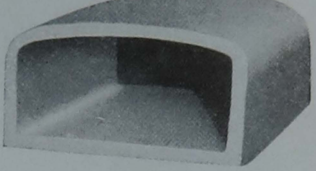
Muffles, Refractory Clay



Shape 2



Shape 3



Shape 4

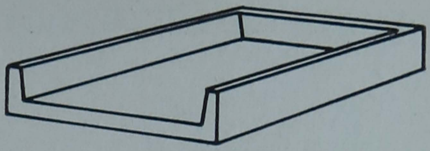
276M1

276M1 Muffles, Clay. Molded with special care from high grade refractory clay. In addition to the muffles listed below, muffles made to suit specifications or requirements can be supplied.

In ordering, please specify the designating letter. When ordering special muffles please be sure to give complete information and dimension sketch.

	Outside Dimensions					Inside Dimensions				
Muffle Letter	Width Inches	Length Inches	Greatest Height Inches	Shape	Vent	Width Inches	Length Inches	Greatest Height Inches	Side Height Inches	**Each**
C	4¾	8	3	2	Circular hole in top	4¼	7¾	2½	....	**$1.25**
CC	4¾	8	3	2	Slot in back	4¼	7¾	2½	....	**1.25**
S627-10	4¾	8	3	2	One circular hole in back	4¼	7¾	2½	....	**1.25**
GE	6	6½	4⅜	4	Circular hole in top	5	6	3½	3½	**1.30**
CF	6	9	4	2	Slot in back	5¼	8¾	3½	....	**1.45**
F	6	10	4	2	Slot in back	5¼	9¾	3¼	....	**1.50**
FF	6	10	4	2	Circular hole in top	5¼	9¾	3¼	....	**1.50**
S627-2	6	10	4	2	One circular hole in back	5¼	9¾	3¼	....	**1.50**
GF	6	10¼	4⅜	4	Circular hole in top	5	9½	3⅝	3⅛	**1.50**
S627-3	6	12	4	2	One circular hole in back	4⅞	11½	3¼	....	**2.35**
CJ	6	12	4	3	Slot in back	5	11½	3¼	2¼	**2.00**
GK	8	12	5¼	4	Circular hole in top	7	11½	4¼	4	**2.15**
S627-12	8	14¼	5⅛	3	One circular hole in back	6⅝	13⅝	4¼	2⅝	**2.15**
LC	8¾	12⅜	5½	4	Circular hole in top	7⅜	11⅝	4⅝	4	**2.15**
LL	9	15	5½	3	Slot in back	7½	14¼	4½	3⅛	**2.35**
II	10	16	6¾	3	Slot in back	8½	15¼	5½	3¾	**3.15**
CII	10	16¾	6¾	3	Slot in back	8½	16	5½	3½	**3.20**
GI	10¼	16	6	4	Circular hole in top	8¾	15¼	4¾	3¾	**3.00**
III	10¼	16¾	6½	3	Slot in back	9	15½	5	4	**3.10**
NN	10⅜	19	6½	3	Two circular holes in back	8¾	18⅛	5⅛	3¾	**3.25**
NNO	10⅜	19	6½	3	Circular hole in top	8¾	18⅛	5⅛	3¾	**3.25**
LD	10½	16	6	4	Circular hole in top	9¼	15¼	4¾	4	**3.00**
RR	10¾	21	6½	3	Two circular holes in back	9	20	5	3¾	**3.55**
PPP	11	20	6½	3	Two circular holes in back	9⅜	19¼	5¼	3½	**4.25**
QQQ	12¼	18¼	7¾	3	Two circular holes in back	11	17¼	6¼	3⅞	**4.05**
QQ	12¼	19	7¾	3	Two circular holes in back	11	18	6¼	3⅞	**4.15**
LF	12¼	20½	8	4	Circular hole in top	10½	19½	6½	5	**4.50**
USQQ	12¼	21	7¾	3	Three circular holes in back	10½	20¼	6¼	3⅞	**4.50**
GU	14	18	6¾	4	Circular hole in top	12½	17	5¼	3⅞	**5.20**
U	14	18	7¼	3	Two circular holes in back	12½	17	5⅝	3⅞	**5.20**
UUU	14	19	9¾	3	Two circular holes in back	12¼	18	5⅞	....	**5.20**
UM	14	21½	7¼	3	Two circular holes in back	12¼	20½	5⅝	3¾	**5.20**
UU	14¼	19	7¼	3	Two circular holes in back	12½	18¼	6	4	**5.20**
S-143	14¼	22	7½	3	Two circular holes in back	12¼	21	5¾	3⅞	**5.20**
LG	14¾	20¾	7⅜	4	Circular hole in top	13¼	20¼	6	4⅜	**5.20**
VV	14⅝	19	7¾	3	Two circular holes in back	15½	18	5⅞	....	**5.20**
LE	15¼	18	7⅛	4	Circular hole in top	13⅜	17	5⅝	4⅜	**4.25**
LJ	17¼	25	9⅛	3	Circular hole in top	15	24	7¼	5½	**6.70**
*Z	29	54	12	3	No vent	26	51¾	8¾	5½	**40.00**

*For roasting.



277M1

277M1 Muffle Hearths, Semi-Muffles, Silicon Carbide. Used in the place of regular muffles for crucible fusions only.

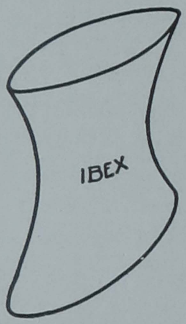
Letter	**GK-H**	**GI-H**	**GU-H**	**UU-H**	**LF-H**	**LG-H**	**LJ-H**
Width, outside, inches	8	10¼	14	14¼	12¼	14¾	17¼
Length, outside, inches	12	16	18	19	20½	20¾	25
Height, outside, inches	3	3	3	3	3	3	3
Each	**$3.50**	**5.75**	**7.75**	**7.50**	**8.60**	**10.10**	**13.50**

277M2 Muffle Support Plates, Silcar. Silicon Carbide. For supporting muffles and sometimes used in place of regular muffles.

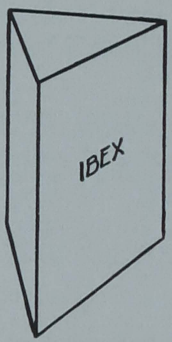
Letter	**NN**	**LF**	**QQ**	**TXX**	**LG**	**GU**	**GU**	**UU**
Thickness, inches	1	1	1	1	1¼	1	1¼	1¼
Width, outside, inches	10¼	12	12¼	16	14½	14	14	16
Length, outside, inches	19	20½	19	22	20	18	18	20
Weight, pounds	17	22	20	32	33	23	28	36
Each	**$4.45**	**5.00**	**4.80**	**8.00**	**6.05**	**5.00**	**5.95**	**9.00**

277M3 Muffle Support Plates, Clay.

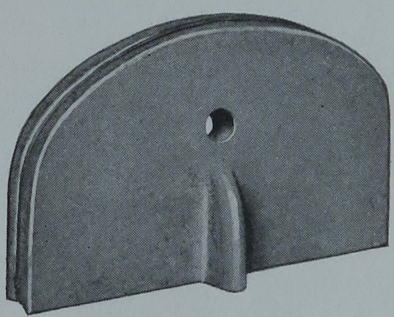
Letter	**GK**	**GI**	**LF**	**LG**	**LJ**	**NN**	**QQ**	**GU**	**GU**	**S-173**
Thickness, inches	⅝	⅞	1	1	1	1¼	1¼	1	1¼	1¼
Width, outside, inches	8	10	12¼	14½	17¼	10½	12	14	14	17
Length, outside, inches	12	16	20½	21	24	17	16	18	17	21
Each	**$ .60**	**1.00**	**1.60**	**1.75**	**2.25**	**1.25**	**1.25**	**1.50**	**1.50**	**2.25**



277M4-277M9



277M5-277M13



277M18

DENVER FIRE CLAY Co

277M19

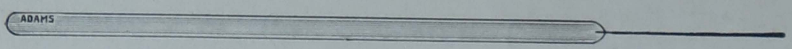
277M4 Muffle Stools, Clay. Streamline clay stools, 5½ inches high.	**Each**	**$ .20**
277M5 Muffle Stools, Clay. Triangular clay stools, 6x3¾x3¾ inches.	**Each**	**$ .20**
277M6 Muffle Stools, Clay. Triangular clay stools, 6½x3¾x3¾ inches.	**Each**	**$ .25**
277M7 Muffle Stools, Clay. Triangular clay stools, 7½x3¾x3¾ inches.	**Each**	**$ .30**
277M8 Muffle Stools, Clay. Triangular Clay stools, 8½x3¾x3¾ inches.	**Each**	**$ .35**
277M9 Muffle Stools, Silcar. Silicon Carbide. Streamline stools, 5½ inches high.	**Each**	**$1.05**
277M10 Muffle Stools, Silcar. Silicon carbide. Streamline stools, 6½ inches high.	**Each**	**$1.20**
277M11 Muffle Stools, Silcar. Silicon carbide. Streamline stools, 7½ inches high.	**Each**	**$1.40**
277M12 Muffle Stools, Silcar. Silicon Carbide. Streamline stools, 8½ inches high.	**Each**	**$1.50**
277M13 Muffle Stools, Silcar. Silicon Carbide. Triangular stools, 6x3¾x3¾ inches.	**Each**	**$1.25**
277M14 Muffle Stools, Silcar. Silicon Carbide. Triangular stools, 6½x3¾x3¾ inches.	**Each**	**$1.35**
277M15 Muffle Stools, Silcar. Silicon Carbide. Triangular stools, 7½x3¾x3¾ inches.	**Each**	**$1.50**
277M16 Muffle Stools, Silcar. Silicon Carbide. Triangular stools, 8½x3¾x3¾ inches.	**Each**	**$1.65**
277M17 Muffle Bricks, Silcar. Silicon Carbide, Standard. 9x4½x2½ inches.	**Each**	**$1.35**

277M18 Muffle Doors, Clay.

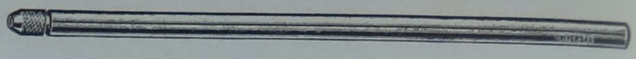
For Muffles	GC	GE	GK	LL	GI	NN	QQ	UU	VV	S-173
Each	**$ .60**	**.60**	**.70**	**.60**	**.70**	**.60**	**.60**	**.80**	**1.15**	**1.50**

277M19 Muffle Doors, Iron.

For Muffles	LL	NN	QQ	GU	VV	UUU
Each	**$1.20**	**1.40**	**1.80**	**1.80**	**2.00**	**2.00**



278M1

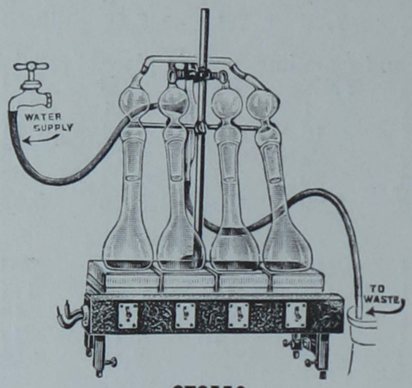


278M5

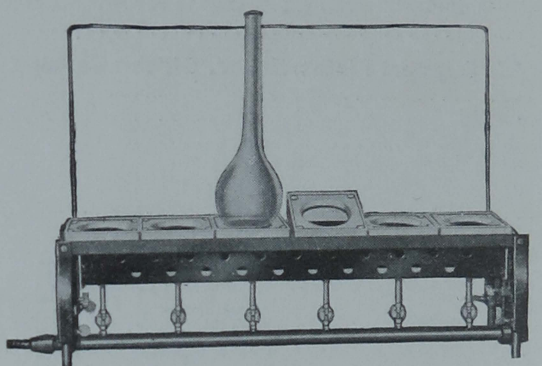
278M1 Needles, Inoculating. Aluminum rod with 2-inch 26-gauge platinum wire. **Each** **$1.00**
278M2 Needles, Inoculating. Aluminum rod with 3-inch 25-gauge nichrome wire. **Each** .... **$ .25**
278M3 Needles, Inoculating. Glass rod with 2-inch 26-gauge platinum wire. **Each** .... **$ .75**
278M4 Needles, Inoculating. Glass rod with 3-inch 25-gauge nichrome wire. **Each** .... **$ .25**
278M5 Needle Holders, Inoculating. Aluminum. ¼ inch in diameter, with adjustable chuck. **Each** .... **$ .50**

For nichrome wire, see page 402.
For platinum wire, see page 320.

Nitrogen Determination Apparatus



278M6



278M9

Nitrogen Digestion Apparatus, Sy Fumeless, Electrically Heated. Four-unit outfit for 500 ml. or 800 ml. flasks. Each 550-watt heater is controlled by a double pole 15-ampere switch; current consumption, 2200 watts. Complete with glassware including 500 ml. flasks.

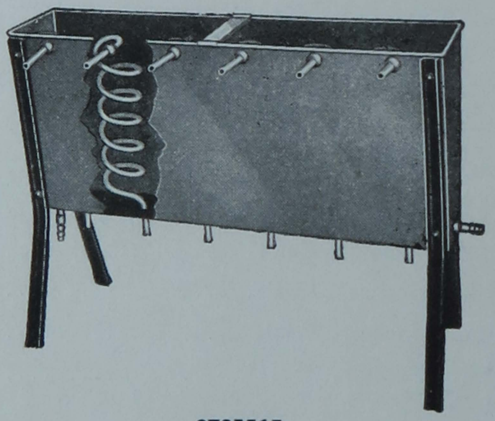
278M6 Nitrogen Digestion Apparatus, Sy Fumeless. For 110 volts. **Each** **$47.00**
278M7 Nitrogen Digestion Apparatus, Sy Fumeless. For 220 volts. **Each** **$47.00**
278M8 Nitrogen Digestion Apparatus, Sy Fumeless, Gas Heated. Otherwise same as 278M6. The burner manifold can be raised or lowered on the support which is equipped with adjustable burners of the Fletcher type. Support stand includes a 4-ring metal shelf adjustable for height to accommodate either 500 or 800 ml. flasks. Complete with glassware, including 500 ml. flasks. **Each** **$23.50**

Nitrogen Adjusting Shelf, Kjeldahl, Gas Heated. For 500 ml. or 800 ml. flasks. A removable flame shield of Monel metal is around the top of the burner bank. Equipped with Fletcher type burners. Please specify kind of gas to be used. Without glassware.

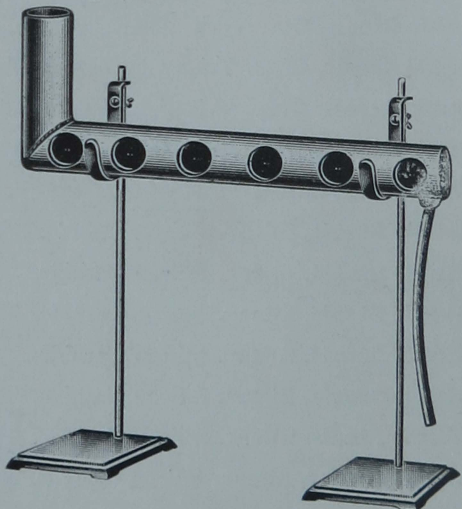
278M9 Nitrogen Digesting Shelf, Kjeldahl, 6 Units. Length, 32 inches. **Each** **$31.00**
278M10 Nitrogen Digesting Shelf, Kjeldahl, 12 Units. Length, 62 inches. **Each** **$61.50**

Nitrogen Digesting Shelf, Kjeldahl, Electrically Heated. Accommodates either 500 or 800 ml. flasks. Each heater is controlled by a separate double pole 15-ampere snap switch. Depth of each shelf, front to back, 8½ inches. Without glassware.

278M11 Nitrogen Digesting Shelf, Kjeldahl. 6 units, 110 volts, 3300 watts. Length, 32 inches. **Each** .... **$ 62.00**
278M12 Nitrogen Digesting Shelf, Kjeldahl. 6 units, 220 volts, 3300 watts. Length, 32 inches. **Each** .... **$ 62.00**
278M13 Nitrogen Digesting Shelf, Kjeldahl. 12 units, 110 volts, 6600 watts. Length, 62 inches. **Each** **$120.00**
278M14 Nitrogen Digesting Shelf, Kjeldahl. 12 units, 220 volts, 6600 watts. Length, 62 inches. **Each** **$120.00**



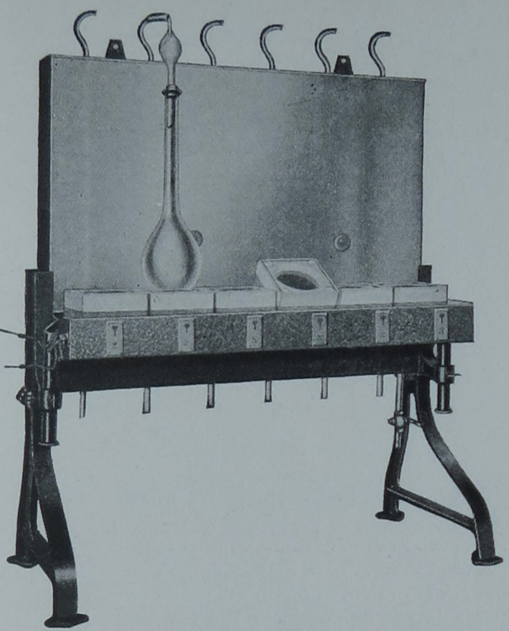
278M15



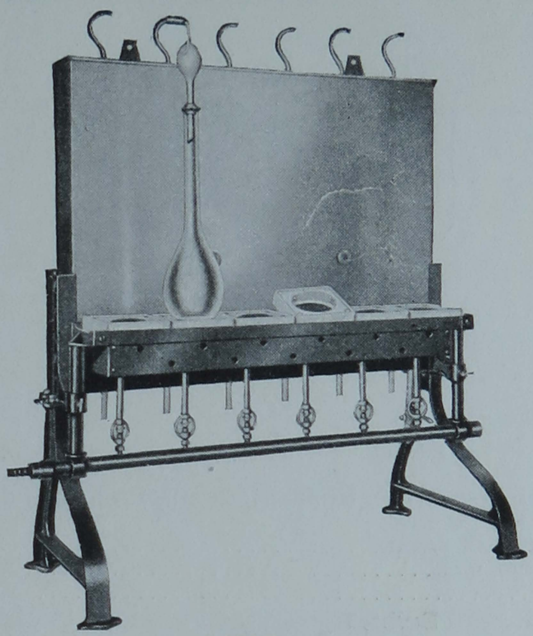
278M16

278M15 Condensers, Kjeldahl. Strongly reinforced, heavy tin-lined copper tank, equipped with pure block tin spiral condensing coils 5 inches apart. Overall length, 32 inches. Complete with 6 coils. **Each** **$40.00**
278M16 Lead Fume Ducts. With 6 openings, 2 inches in diameter, spaced on 5-inch centers on the lead tubing which is 4 inches in diameter. Each pipe includes an elbow 6 inches long, and a lead drip tube at the right end for drain. No supports. 30 inches long. **Each** **$22.00**
278M17 Lead Fume Ducts. With 12 openings. 60 inches long. Otherwise same as 278M16. **Each** **$30.00**

Nitrogen Determination Apparatus, Continued



279M1



279M5

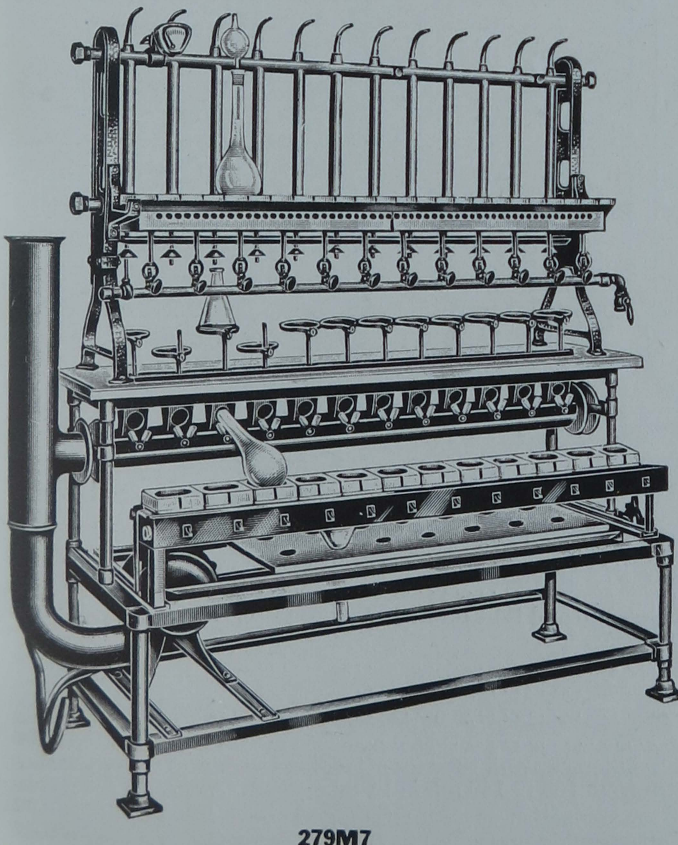
Nitrogen Distilling Apparatus, Kjeldahl. Will accommodate either 500 or 800 ml. flasks. Supplied with stand for table installation or without stand for wall installation. Dimensions: Units, center to center, 5 inches; overall height, without stand, 28 inches; overall height, with stand, 40 inches; overall depth, 17 inches.

Electrically Heated, 6 Unit, 3300 Watts.

Volts	110	220
279M1 Apparatus with Stand. Each	**$123.75**	**123.75**
279M2 Apparatus, without Stand. Each	**$119.25**	**119.25**

Electrically Heated, 12 Unit, 6600 Watts.

Volts	110	220
279M3 Apparatus, with Stand. Each	**$218.00**	**218.00**
279M4 Apparatus, without Stand. Each	**$212.00**	**212.00**



279M7

Gas Heated. Consists of gas manifold with all brass Fletcher type burners. The manifold is arranged for either right- or left-hand connection to the gas supply. A removable flame shelf of Monel metal supports the top of the burner bank, so that direct draft to the flame is prevented. Specify kind of gas to be used.

Number of units	6	12
279M5 Apparatus, with Stand. Each	**$87.50**	**160.00**
279M6 Apparatus, without Stand. Each	**$80.00**	**152.00**

279M7 Nitrogen Determination Apparatus, Combination. A complete electric digestion, gas distilling installation, blower type, with new pent type fume ducts, and multi-tube condensers. All elements are mounted upon a double deck tubular steel frame with transite asbestos top and with perforated transite asbestos flask drying rack. The digestion shelf is equipped with 550 watt electric heaters, each fitted with reversible refractory flask rests to fit either 500 or 800 ml. Kjeldahl flasks and controlled by individual snap switches. The fume duct is supplied with individual pent type fume hoods for flasks. A positive draft in the fume duct is maintained by an electric motor driven blower mounted beneath the digestion shelf.

A distilling shelf located above the digesting shelf is equipped with seamless brass inlet and outlet water manifolds with pure block tin condenser tubes. The shelf for distilling flasks consists of an angle iron frame carrying a Monel metal flame shield and individual reversible refractory flask rests beveled to fit either 500 or 800 ml. Kjeldahl flasks. The burner manifold is equipped with individual adjustable Fletcher type burners with crown tops, bronze stopcocks and Bakelite handles. Individual flask pans adjustably attached to vertical metal rods are supplied for support of each receiving flask. A dial type indicating thermometer with electric signal contact shows water temperature.

Height, 80 inches; width, 24 inches; length, 46 inches.

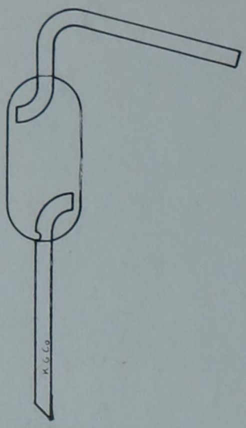
Burners are designed to employ artificial or mixed gas of heat value not exceeding 800 B. t. u.'s.

For operation from 110-volt A. C., 60-cycle circuits.

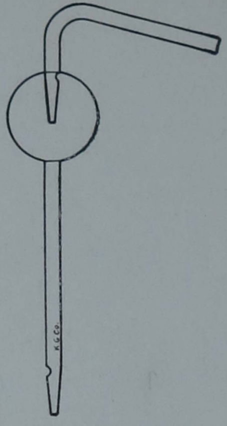
Complete with 12-burner units and 12 electric units, blower and thermometer, but without glassware. **Each $600.00**

Note: Can be furnished in 6, 12, 18 or 24 units, for all gas, all electric or combinations of either. Also supplied to meet various gas and current requirements. Prices on application.

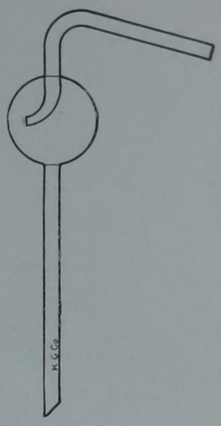
Nitrogen Determination Apparatus, Continued



280M1



280M2



280M3

280M1 Nitrogen Bulbs, Kjeldahl, Connecting, Cylindrical. With two curved stems inside the bulb; with hole in lower stem near the seal.

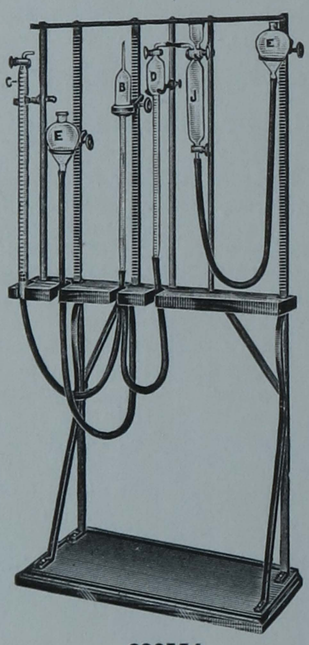
Diameter, bulb, mm.	45	55
Length, bulb, mm.	100	120
Each	$1.00	1.20

280M2 Nitrogen Bulbs, Kjeldahl, Connecting, Hopkins. With straight tip inside the bulb at the top, with hole in tip near the seal.

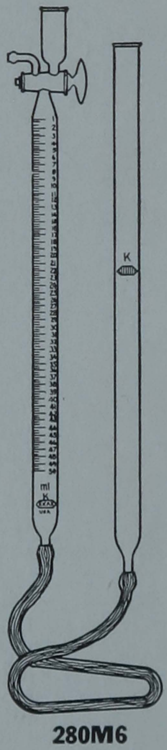
Diameter, bulb, mm.	52	65
Each	$ .80	1.00

280M3 Nitrogen Bulbs, Kjeldahl, Connecting, Spherical. With single curved tip inside the bulb.

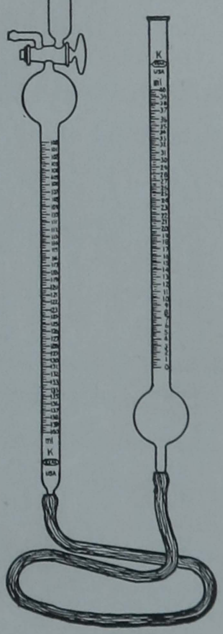
Diameter, bulb, mm.	52	65
Each	$ .70	.90



280M4



280M6



280M8

280M4 Nitrometers, Du Pont, A. S. T. M. D-301. For the volumetric determination of nitrates. Complete with stand, necessary upright rods, rings and supports; all glass and rubber parts. **Each** $95.00

280M5 Complete Glass Parts and Rubber Tubing, Only. For 280M4. **Set** $25.00

280M6 Nitrometers, Lunge. With 3-way stopcock at top having filling cup and tube for attaching to train. The graduated tube has no bulbs.

Capacity, ml.	50	100
Graduated, ml.	$\frac{1}{10}$	$\frac{1}{5}$
Each	$4.00	4.50

280M7 Levelling Tubes, Only. Each	$ .50	.50

280M8 Nitrometers, Lunge. With 3-way stopcock at the top having filling cup and tube for attaching to train. The bulb below the stopcock has a capacity of 100 ml. and the stem is graduated down from 100 to 140 ml. in $\frac{1}{10}$ ml. **Each** $6.00

280M9 Levelling Tubes, Lunge. For 280M8 nitrometers. Has a hose connection at the bottom, and above this a bulb holding approximately 100 ml. The stem above the bulb is graduated in $\frac{1}{10}$ ml., reading up from 0 to 40 ml. **Each** $3.00

Oil Testing Apparatus

281M1 Oil Manual, Tag. New and revised edition. Contains gravity temperature correction tables, additional tables, data and testing methods which are useful to oil chemists and inspectors. In cloth binding, stamped in gold. **Each**.......... **$1.00**

281M2 Viscosity-Temperature Index Charts, Tag. For making comparisons of viscosities at various temperatures, including Saybolt, Universal and Furol, Redwood, Engler and the corresponding kinematic values. In addition, this alignment chart supplies a means for determining accurately viscosity index numbers from known viscosities. Size, 22x16 inches. Pad of 25 charts.. **$2.50**

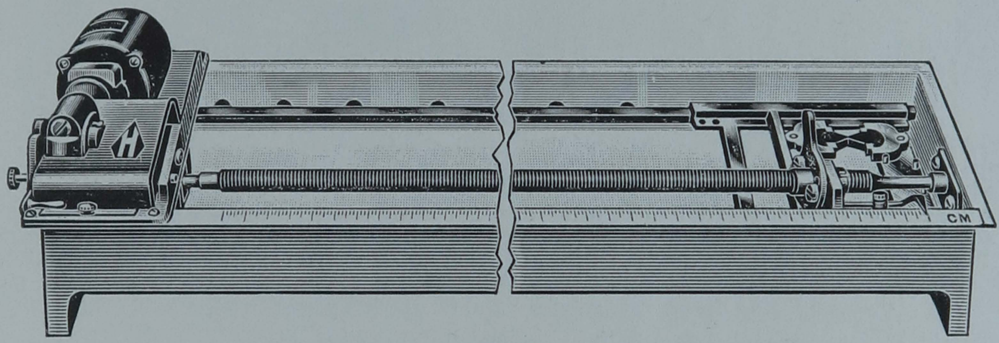
281M3 Viscosity-Temperature Index Charts, Tag. Same as 281M2, except single copies printed on heavy bristol board. **Each**.......... **$1.25**

281M4 Viscosity Temperature Charts, Tag. A. S. T. M. D-341-T. Temperature range of –30° F. to 450° F. with a viscosity range of from 33 to 100,000,000 Saybolt Universal seconds. Size: 20x16 inches. **Pad** of 25 charts.......... **$1.50**

281M5 Viscosity Temperature Charts, Tag. A. S. T. M. Abridged. Temperature range of –30° F. to 350° F. with a viscosity range of 33 to 100,000 seconds. Size: 8½x11 inches. **Pad** of 50 charts.......... **$2.00**

281M6 Viscosity Blending Charts, Tag. Provides a convenient means for obtaining the viscosity of blends. Size, 13x11 inches. **Pad** of 25 charts.......... **$1.00**

281M7 Gravity Temperature Charts, Tag. A. P. I. Contains the complete A. P. I. Gravity Temperature Correction Table and the complete Pounds per Gallon Table. Size, 34½x33 inches. Single sheets. **Each**.......... **$ .50**



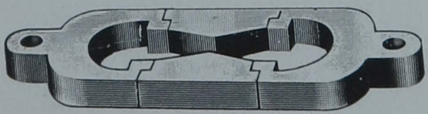
281M8

281M8 Ductility Machines, Direct Motor Driven. A. S. T. M. D-113. For determining the ductility of an asphalt cement, or semi-solid bitumen by measuring the distance to which it will elongate before breaking when two ends of a standard briquet are pulled apart 150 cm. at the specified speed of 5 cm. per minute at a temperature of 25° C. (77° F.). Built in a cast iron trough, porcelain enameled inside, in which briquets are immersed in water. Three briquets can be tested simultaneously. All working parts are made of brass. The motor maintains a constant speed. Carriage is moved by rotating screw which is entirely out of water so that it may not cause premature rupture of the specimen. Rate of speed is exactly 5 cm. per minute. A pointer traveling with the carriage indicates the exact position of the carriage on a machine-cut linear centimeter scale attached to one side of the trough. Pointer is adjustable for zero setting. Maximum carriage travel is 150 cm. at which point it will stop automatically. Furnished with 110-volt, 60 cycle, A. C. motor, cord and plug, and three standard briquet molds. **Each**.......... **$300.00**

281M9 Ductility Machines, Direct Motor Driven, Two-Speed. Same as 281M8, except geared for a speed of ¼ cm. per minute, in addition to the standard speed of 5 cm. per minute. Furnished with 110-volt, 60-cycle, A. C. motor, cord and plug and three standard briquet molds. **Each**.......... **$320.00**

281M10 Ductility Machines, Direct Motor Driven, Three-Speed. Same as 281M8, except geared for speed of ¼ cm. and 1 cm. per minute, in addition to the standard speed of 5 cm. per minute. Furnished with 110-volt, 60-cycle, A. C. motor, cord and plug and three standard briquet molds. **Each**.......... **$340.00**

281M11 Ductility Machines, Direct Motor Driven, Short. Same as 281M8, except shorter. With a maximum carriage travel of 50 cm. Geared for a speed of ¼ cm. per minute for tests at a temperature of 0° C. (32° F.). Furnished with 110-volt, 60-cycle, A. C. motor, cord and plug and three standard briquet molds. **Each**.......... **$290.00**
Note: For other types of current, prices on application.



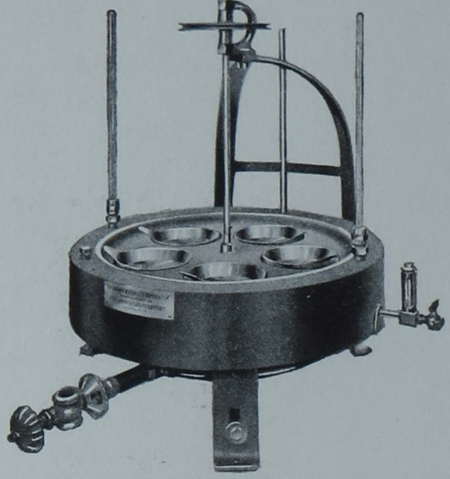
281M12

281M12 Ductility Molds. A. S. T. M. D-113. For making standard briquets for use in ductility elongation tests of bituminous materials. Segments are carefully machined to specified dimensions. Tension lugs are cast into end segments.

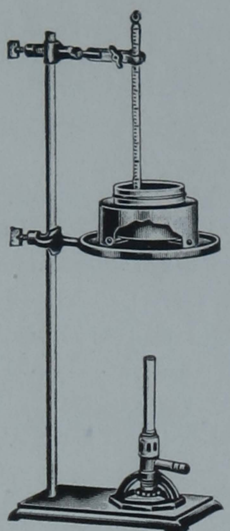
Similar parts of different molds are interchangeable and require no numbering or matching. **Each**.......... **$4.75**

281M13 Base Plates, Brass. For use with 281M12. **Each**.......... **$1.25**

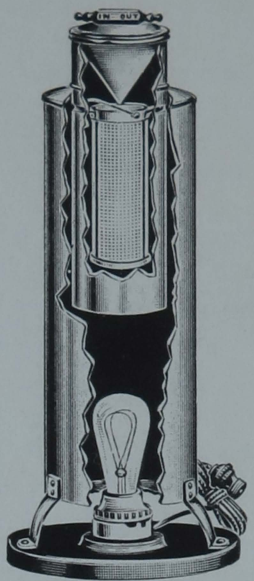
Oil Testing Apparatus, Continued



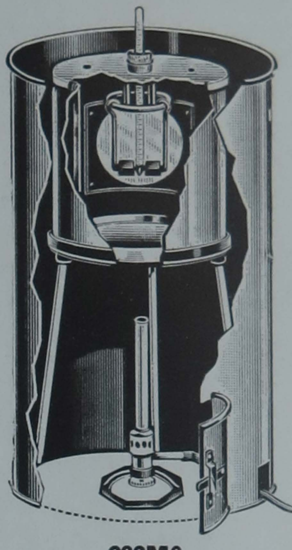
282M1



282M3



282M5



282M6

282M1 Asphalt Evaporator, Brown. For reducing asphaltic petroleum to asphalt. Requires only one-fifth time commonly required by an oven and gives consistent results. Utilizes an oil bath as a heating medium. It is contained in a closed cast iron pan, 18 inches in diameter and 4 inches deep. Circulation of the heating medium is maintained constantly by a belt-driven impeller on a vertical shaft in the center of the pan. Oil temperatures are secured by a special circular burner under the pan and provision is made for a thermometer on each side of the bath. An oil gauge with drain-cock and vent-pipe is included. The cover of the oil bath is provided with five pockets which carry the seamless brass evaporating pans. Dimensions: overall diameter, 20 inches; height, 24 inches. Weight: net, 65 pounds; shipping, 110 pounds. Complete with five seamless brass pans, numbered one to five, 4 inches in diameter by ¾ inches deep; ring burner; gauge glass; and two thermometers, range 30° to 700° F. **Each**......**$79.00**

For thermometers, see 378M7.

282M2 Pans. For 282M1. Brass; seamless. Diameter, 4 inches; depth, ¾ inch. **Each**....................................**$1.25**

282M3 Asphalt Residue Apparatus. A. S. T. M. D-243. The apparatus utilizes a cast iron air bath supported on a metal hot plate for heating the sample container, which is a flat bottom, cylindrical tin box of specified dimensions. Complete with support; A. S. T. M. specified thermometer, range 20° to 760° F. in graduations of 5°; special themometer clamp; and adjustable all-brass Tirrill type gas burner. **Each**....................................**$9.50**

282M4 Bath and Cup, Only. Set....................................**$1.50**

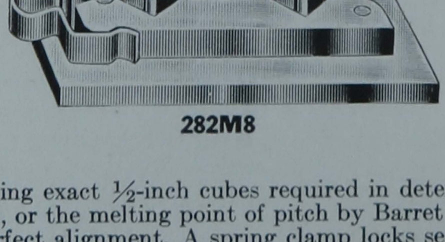
For penetrometers, see page 309.
For thermometers, see 381M15.
For tin sample boxes (ointment cans), see page 67.

282M5 Extractors, N. Y. Testing Laboratory Type. A. S. T. M. D-147. For testing coarse aggregates or mineral matter retained on a 10-mesh sieve in the analysis of mastics, grouts and similar mixtures. Hot vapors from the solvent bathe the extractive material. An 80-mesh brass wire basket is suspended inside the extraction cylinder at the top which of is a conical reflex condenser. To confine heat radiation from the 50-watt bulb, the extractor is housed in a brass cylinder, on a varnished hardwood base. All exterior metal surfaces are highly polished. Total height, 22 inches; base diameter, 11 inches. Complete with 50-watt lamp, cord and plug. **Each**....................................**$60.00**

282M6 Melting Point Air Ovens. Barrett Method D-7 for pitches melting over 77° C. Cube is suspended in an air oven, temperature raised 5° C. each minute, and temperature at instant pitch drops to bottom of oven taken as melting point. Apparatus consists of copper oven with mica windows and shallow pan bottom, supported on a tripod inside a metal shield having a latched door and mica window. Dimensions of shield: diameter, 8½ inches; height, 14½ inches. Complete with 4 suspension hooks, all brass Tirrill type adjustable burner and A. S. T. M. high softening point thermometer, range 85° to 320° F. in graduations of 1°. **Each**....................................**$24.00**

282M7 Air Oven, Only. Includes shallow pan, suspension rail and 4 suspension hooks. **Each**....................................**$9.50**

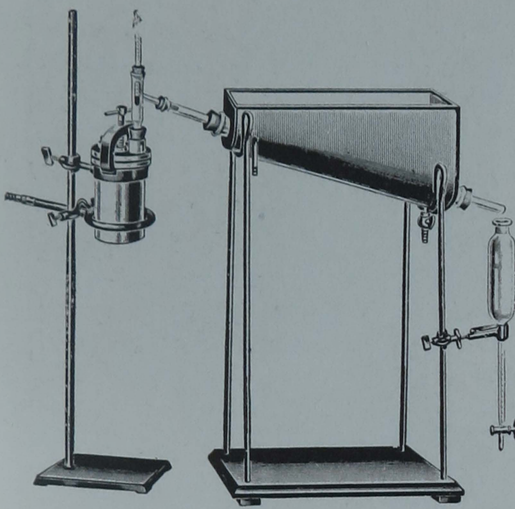
For thermometers, see 381M31.



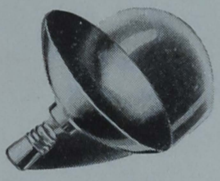
282M8

282M8 Molds, Softening Point. For forming exact ½-inch cubes required in determining the softening point of tar products by the A. S. T. M. Cube and Water Method, or the melting point of pitch by Barret Method D-7. Double type. With both segments pinned to the brass base plate for perfect alignment. A spring clamp locks segments together while cubes are being cast, and core pins in the base plate produce accurately centered suspension holes in the cubes. **Each**....................................**$7.50**

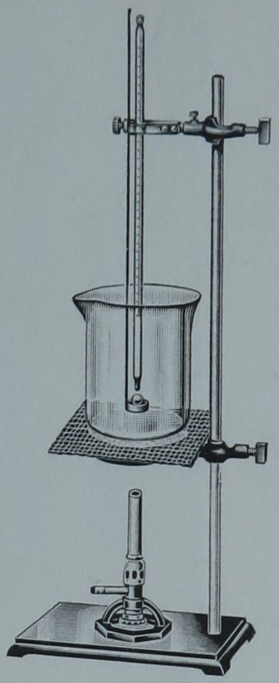
Oil Testing Apparatus, Continued



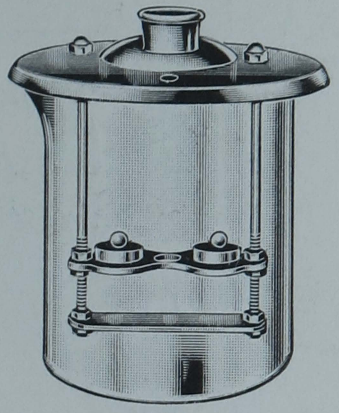
283M1



283M3



283M5



283M9

283M1 Dehydrating Apparatus, A. S. T. M. D-370. For the determination of the percentage of water in creosote-oil and creosote coal-tar solution. Complete apparatus consists of a 3½x6-inch copper still heated by a ring burner having holes on the inner periphery; copper condenser trough with drain cock and overflow; resistance glass condenser tube; Hempel distilling tube; graduated receiving funnel; necessary clamps and supports; and A. S. T. M. thermometer, range 0° to 400° C. in graduations of 1°. Complete with glassware and thermometer. **Each** **$40.00**

283M2 Dehydrating Apparatus. Same as 283M1, except with thermometer range, 30° to 760° F. in 2° graduations. **Each** **$40.00**
For thermometers, see 381M6 and 381M4.

283M3 Float Test Apparatus, A. S. T. M. D-139. For determining the consistency of semi-solid bituminous materials. With float and three collars. **Each** **$12.00**

283M4 Collar, Only. For 283M3. **Each** **$1.50**

283M5 Softening Point Apparatus, Ring and Ball, A. S. T. M. D-36. Single unit. With ring attached to brass wire stem, 16 inches long, suspended from thermometer clamp. Complete with steel ball, support and clamp, wire gauze, adjustable burner, and beaker. Without thermometer. **Each** **$6.50**

283M6 Ring and Stem, Only. For 283M5. **Each** **$1.50**

283M7 Softening Point Apparatus, Ring and Ball, Four-Place. Same as 283M5, except with four-place ring and ball holder attachment with thermometer sleeve. Without thermometer. **Each** **$11.00**

283M8 Ring Assembly, Only. Four-place. For 283M7. With thermometer sleeve. **Each** **$6.50**
Note: Ring and ball apparatus (tapered form) to conform to A. S. T. M. specifications E-28-T can be supplied. Information and prices on request.

283M9 Softening Point Apparatus, Two-Place. Shelf type. For determining the softening point of bituminous materials. Two shelves are spaced exactly one inch apart, and are suspended from a brass cover. Upper shelf has three openings, two for rings and one for thermometer. Cover fits 600 ml. beaker. Complete with beaker, 2 rings and 2 hardened steel balls. Without thermometer. **Each** **$6.50**

283M10 Pitch Ring, Only. For 283M9. **Each** .... **$ .70**

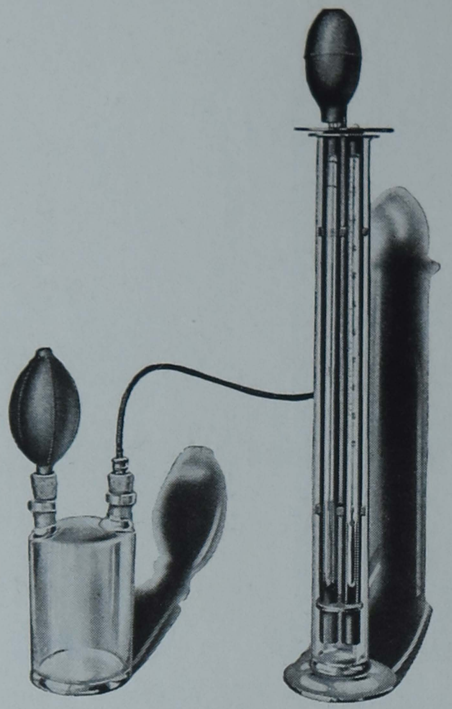
283M11 Ball Centering Guide. For 283M9. Slips over the pitch ring. Has four prongs to center the steel ball on the pitch sample, but allows ample room for ball to drop freely. **Each** **$1.25**

283M12 Steel Balls. Made to A. S. T. M. specifications for use in 283M5, 283M7 and 283M9 softening point apparatus. **Dozen** **$1.00**

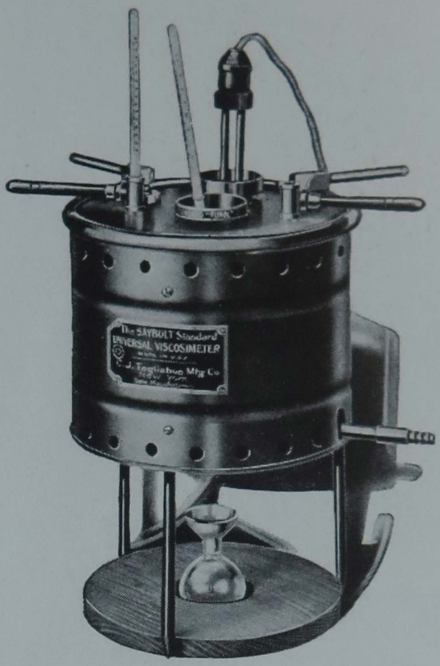
A. S. T. M. Thermometers, Softening Point, Tag. See Page 381 for Prices

Number	55761	55762	55763	55764
Range	−2 to 80° C.	30 to 160° C.	30 to 180° F.	85 to 320° F.
Graduations	⅕°	½°	½°	1
Length, inches	15	15	15	15
Immersion	Total	Total	Total	Total

Oil Testing Apparatus, Continued



284M1



284M6

284M1 Thermo-Viscometers, Saybolt, Tag. For determining the viscosity of kerosene and gasoline. Uses "long-tube capillary" principle. Complete with high precision thermometer, range 60 °to 110° F. in ⅕°, and temperature correction tables. **Each** $56.00

Item	Price
284M2 Capillary Tubes. Each	$15.00
284M3 Rubber Bulbs. Each	$ .30
284M4 Woulff Bottle. Each	$2.00
284M5 Jar. Each	$ .80

For thermometer, see 381M35.

284M6 Viscosimeters, Saybolt, Universal, Tag. A. S. T. M. D-88. Manual stirring and heat control. Complete with replaceable Universal tip (interchangeable with Furol tip), electric immersion heater, six A. S. T. M. viscosity thermometers, two with range 94° to 108° F. in ⅕°, two with range 120° to 134° F. in ⅕°, and two with range 204° to 218° F. in ⅕°, and accessories, but without stop-watch.

Volts	110	220
Each	$101.00	101.00

284M7 Viscosimeters, Saybolt, Furol, Tag. A. S. T. M. D-88. Manual stirring and heat control. Complete with replaceable Furol tip (interchangeable with Universal tip), two A. T. S. M. viscosity thermometers, range 120° to 134° F., and accessories but without stop-watch.

Volts	110	220
Each	$87.00	87.00

284M8 Viscosimeters, Saybolt, Universal and Furol, Tag. A. S. T. M. D-88. Same as 284M6, except supplied with interchangeable Universal and Furol tips with special wrench for changing.

Volts	110	220
Each	$111.00	111.00

Note: For stopwatches, see page 285.

Accessories and Parts

Item	Price
284M9 Receiving Flask, Pyrex. 60 ml. **Each**	$ .90
284M10 Pipette. Each	$ .60

284M11 Immersion Heater. With cord and plug.

Volts	110	220
Each	$8.50	9.00

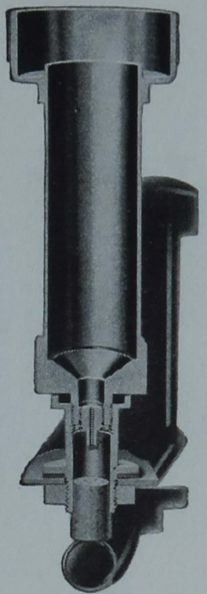
Item	Price
284M12 Iron Stand. Each	$2.80
284M13 Turn Table Attachment. Each	$25.00
284M14 Copper Bath. Each	$6.30
284M15 Gas Ring Burner. Each	$1.30
284M16 Strainer. 100-mesh. **Each**	$ .50
284M17 Wood Base. Each	$ .30
284M18 Pan. With lip. **Each**	$ .30
284M19 Tube Cleaning Plunger. Each	$ .40
284M20 Thermometer Guard. To prevent thermometer bulb from touching orifice. **Each**	$ .75

A. S. T. M. Viscosimeter Thermometers, Etched Stem, Tag. For prices, see page 381

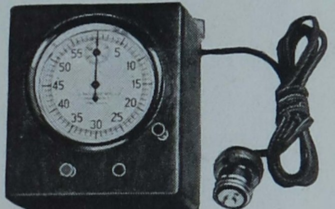
Number	55443	55444	55445	55446	55447	55448	55449
Range, degrees, F.	66–80	94–108	120–134	138–154	204–218	134–148	174–188
Test points, degrees, F.	70, 77	100	122, 130	150	210	140	180

Oil Testing Apparatus, Continued

285M1



285M20



285M32

285M1 Viscosimeters, Thermostatic, Saybolt, Tag. A. S. T. M. D-88. With motor stirrer and automatic temperature control. Temperature of bath is held constant to ±0.1° F. at any test point between room temperature and 220° F. Vibrating contacts actuated by cam on propeller shaft eliminate sticking. Heating coils are inexpensive, easily replaceable. Complete with receiving flask guide and cooling coil. Without oil tubes, thermometers, flasks, stop-watch, pipette, strainer or pan. Suitable for operation on 110 volts, 60 cycles, A. C.

Number of Saybolt tubes	1	2	4
Each	**$110.00**	**115.00**	**190.00**

285M2 Viscosimeters, Thermostatic, Saybolt, Tag. Same as 285M1, except for 110 volts D. C.

Number of Saybolt tubes	1	2	4
Each	**$110.00**	**115.00**	**190.00**

Note: Voltages other than those listed can be supplied. Prices on application.

Accessories and Parts

285M3 Receiving Flask, Pyrex. 60 ml. **Each** .... **$ .90**

285M4 Pipette. Each .... **$ .60**

285M5 Strainer, 100-Mesh. Each .... **$ .50**

285M6 Pan with Lip. Each .... **$ .30**

285M7 Tube Cleaning Plunger. Each .... **$ .40**

285M8 Thermometer Guard, Metal. To prevent thermometer bulb from touching orifice. **Each** .... **$ .75**

285M9 Motor. 110-volt, 60-cycle, A. C. For 1 and 2-tube bath. **Each** **$18.00**

285M10 Motor. 110-volt, D. C. For 1 and 2-tube bath. **Each** **$18.00**

285M11 Motor. 110-volt, 60-cycle A. C. For 4-tube bath. **Each** **$35.00**

285M12 Motor. 110-volt, 60-cycle D. C. For 4-tube bath. **Each** **$35.00**

285M13 Brush. Each .... **$ .20**

285M14 Pilot Bulb. Each .... **$ .80**

285M15 Heating Coil, 50 W. For 1, 2, or 4 tube. **Each** **$1.00**

285M16 Heating Coil, 500 W. For 1 and 2 tube. **Each** . **$1.00**

285M17 Heating Coil, 1000 W. For 4 tube. **Each** **$1.80**

285M18 Tungsten Points. Each .... **$ .50**

285M19 Rheostat. Variable Heater. **Each** **$4.00**

Viscosimeter thermometers, see page 284.

Viscosimeter Tubes, Saybolt, Tag. A. S. T. M. Barrel is machined from either solid brass or stainless steel. Interchangeable tips are made of hardened stainless steel, each individually standardized. Each tube is supplied with a factory certificate giving variation of the tube, if any, from standard. Tips are changed by means of a special wrench.

285M20 Brass. With Universal tip. **Each** **$40.00**

285M21 Stainless Steel. With Universal tip. **Each** . **$60.00**

285M22 Brass. With Furol tip. **Each** **$40.00**

285M23 Stainless Steel. With Furol tip. **Each** **$60.00**

285M24 Brass. With both Universal and Furol tips and wrench. **Each** **$50.00**

285M25 Stainless Steel. With both Universal and Furol tips and wrench. **Each** **$70.00**

285M26 Viscosimeter Orifices, Saybolt, Interchangeable, Universal. Each **$8.50**

285M27 Viscosimeter Orifices, Saybolt, Interchangeable, Furol. Each **$8.50**

285M28 Viscosimeter Orifices, Interchangeable, for Asphalt. With outflow time approximately 1/10th that of the Furol orifice. (Not specified by A. S. T. M.) **Each** . . . **$15.00**

285M29 Wrench. For changing tips 285M26 and 285M27. **Each** **$1.50**

285M30 Viscosimeter Tubes, Saybolt, Tag, Micro. May be used with any Tag Saybolt viscosimeter. Will furnish an accurate test with only 10 ml. of oil. Factors for converting the readings to standard Saybolt seconds are 4.96 at 100° F. and 5.05 at 210° F. **Each** **$50.00**

285M31 Viscosimeter Receiving Flasks. Special; 7 ml. For use with 285M30. **Each** .... **$ .80**

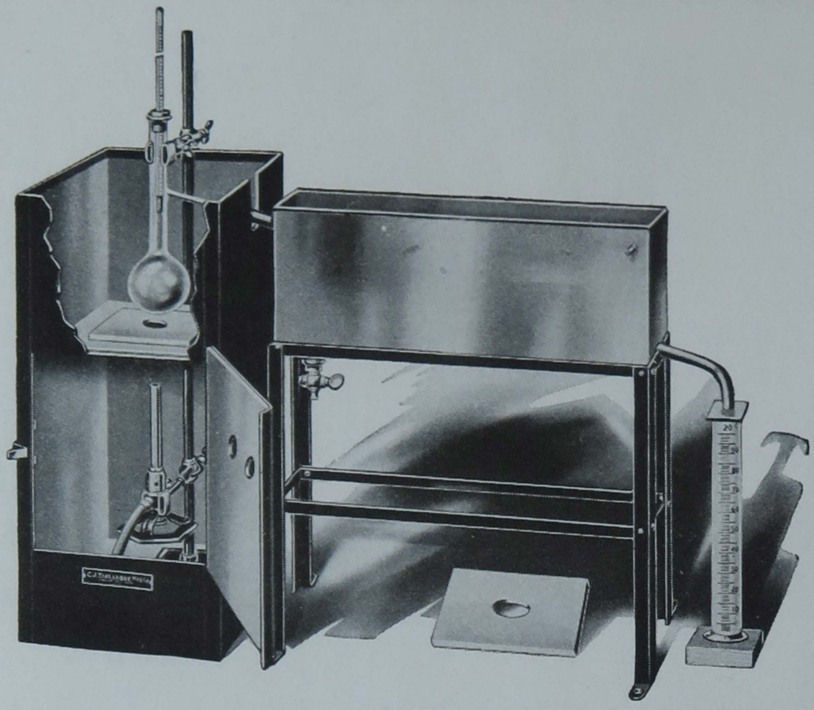
285M32 Electric Timers, 60-Second, Tag. Margin of error is less than 1/5 of a second. 3-inch dial is divided into 60 seconds, each second subdivided into 1/5ths, small dial, divided into 30 minutes. Complete in mahogany case with 6 feet of connecting cord and plug, for 110 volts, 60 cycle A. C. **Each** **$30.00**

285M33 Stop-Watches, Tag, 60-Second. Eleven-jewel. With each second sub-divided into 1/5ths. Total registration, 1800 seconds. **Each** **$19.00**

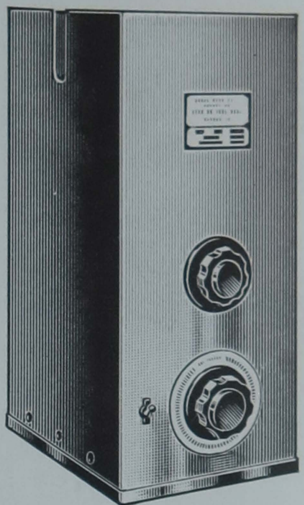
285M34 Stop-Watches, Tag, 100-Second. Total registration, 3000 seconds. **Each** **$30.00**

For other stop-watches, see page 365.

Oil Testing Apparatus, Continued



286M1



286M15

286M1 Distillation Apparatus, Gasoline, Tag. A. S. T. M. D-86 and D-216. For gasoline, naphtha, kerosene and similar petroleum products, turpentine and other paint thinners. The apparatus consists of metal shield; iron support stand with clamps; burner for natural or artificial gas; condenser trough and tube with iron support stand; asbestos heating shelf provided with collar clamp for support rod and 4-inch centered aperture, two asbestos flask plates, 6 inches square by ¼ inch thick, one with 1¼-inch hole, the other with 1½-inch hole; one A. S. T. M. thermometer, range 30 to 580° F.; one A. S. T. M. thermometer, range 30 to 760° F.; 100 ml. Engler distillation flask; and 100 ml. graduated cylinder. Furnished complete with pad of 25 distillation charts. **Each**............ **$36.00**

286M2 Distillation Apparatus, Tag. With Alcohol Burner. Otherwise same as 286M1. **Each**............ **$41.00**

286M3 Distillation Apparatus, Tag. With 110-volt Electric Heater. For A. C. or D. C. Otherwise same as 286M1. **Each**............ **$46.00**

286M4 Distillation Apparatus, Tag. With 220-volt Electric Heater. For A. C. or D. C. Otherwise same as 286M1. **Each**............ **$46.00**

286M5 Distillation Apparatus, Crude Petroleum, Tag, A. S. T. M. D-285. Similar to 286M1, except with Hempel flask, fractionating column and support; 300 ml. measuring pipette; asbestos flask plate, 6 inches square by ¼ inch thick, with 3½-inch hole and A. S. T. M. thermometer, range 30 to 580° F. **Each**............ **$38.00**

286M6 Distillation Apparatus, Gas Oils, Tag. A. S. T. M. D-158. Similar to 286M1, except with Saybolt distilling flask; cylinder graduated to contain 25 ml.; asbestos flask plate, 6 inches square by ¼ inch thick with 2¾-inch hole; and A. S. T. M. thermometer, range 30 to 760° F. **Each**............ **$39.15**

286M7 Distillation Shields, Only. Made of metal, lined with asbestos, in accordance with A. S. T. M. requirements. **Each**............ **$7.50**

286M8 Distillation Condensers, Only. Consists of a single-walled copper cooling bath with a 9/16-inch seamless brass condensing tube, soldered in at an angle of 75°. The bath is provided with water inlet and drain cock, and is mounted on an iron support stand. Dimensions of bath: length, 15 inches; width, 4 inches; height, 6 inches. Length of condensing tube, 22 inches. **Each**. **$8.50**

286M9 Condenser Support Stand, Only. Made of iron, finished in black japan. **Each**............ **$4.00**

286M10 Distillation Charts. Pad of 25............ **$ .40**

286M11 Asbestos Heating Shelves. 8x10x¼ inch thick, with 4-inch hole and collar clamp for rod. **Each**............ **$1.75**

286M12 Asbestos Boards. 6 inches square by ¼ inch thick, as specified in various A. S. T. M. requirements.

Diameter of hole, inches	1¼	1½	2¾	3½
Each	**$ .30**	**.30**	**.35**	**.40**

286M13 Single Jack Chain. For fractionating column. **50-foot length**............ **$ .50**

286M14 Nichrome Support. For jack chain. **Each**............ **$1.50**

286M15 Distillation Shields, Electric. Made of stainless steel, with asbestos insulation on the inside and rubber covered binding around bottom edge. Contains a built-in heater, capable of adjustment from 0 to 750 watts, with a dial control on the side of the shield. For 110 volts, 60 cycles only. Regularly furnished with flask refractory with hole 1¼ inches in diameter, but may be furnished with any refractory listed below at no extra charge. **Each**............ **$75.00**

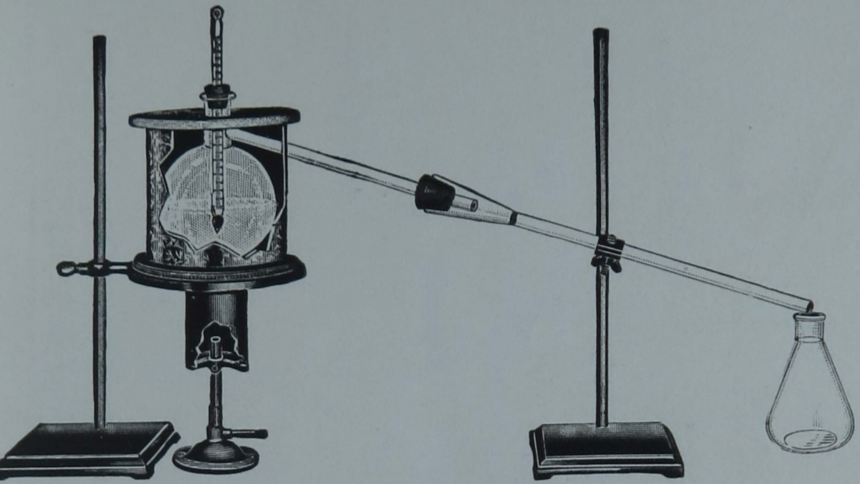
286M16 Flask Refractories. For use with 286M15. With holes as specified by various A. S. T. M. and distillation requirements.

Diameter of holes, inches	1	1¼	1½	2	2¾	3½
Each	**$1.50**	**1.50**	**1.50**	**1.50**	**1.50**	**1.50**

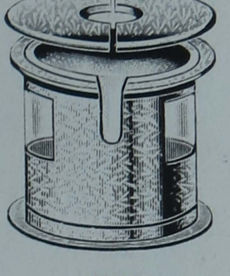
A. S. T. M. Distillation Thermometers, Low and High, Tag. See Page 381 for prices.

Number	55870	55872	55874	55876
Range	30 to 580° F.	30 to 760° F.	0 to 300° C.	0 to 400° C.
Graduations, degrees	2	2	1	1

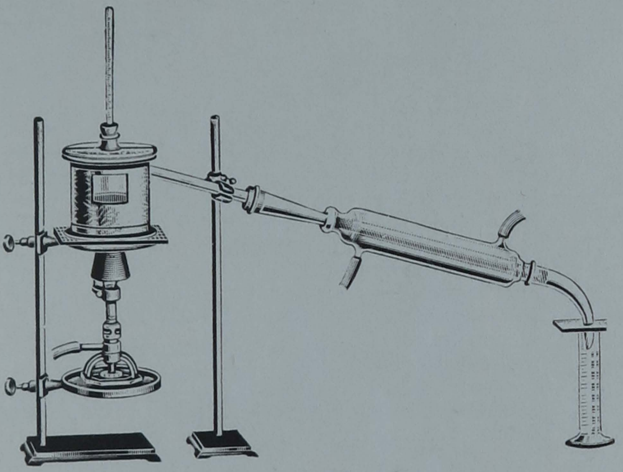
Oil Testing Apparatus, Continued



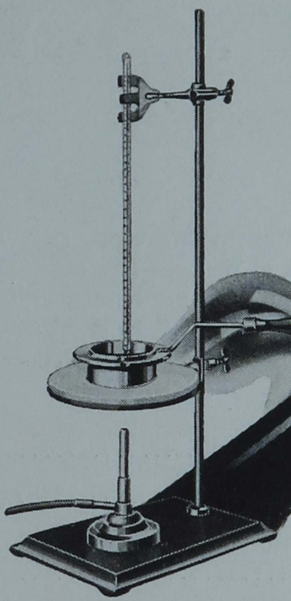
287M1



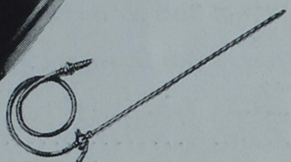
287M7



287M4



287M8



287M13

287M1 Distillation Apparatus, Bituminous. A. S. T. M. D-20 and D-246. For the distillation of bituminous material suitable for road treatment, and for all types and grades of Creosote and mixtures of Creosote with tars and oils used for timber preservation. Consists of specified flask; condenser tube; shield; receiver; adjustable all-brass Tirrill type burner with chimney; supports; and A. S. T. M. Fahrenheit thermometer, range 30° to 760°. **Each** **$14.00**

287M2 Distillation Apparatus, Bituminous. Same as 287M1, except with A. S. T. M. Centigrade thermometer, range 0° to 400°. **Each** **$14.00**

287M3 Distillation Apparatus, Bituminous. Same as 287M1, except without glassware. **Each** **$10.00**

287M4 Distillation Apparatus, Liquid Asphaltic. A. S. T. M. D-402. For the separation of volatile and non-volatile portions of cut-back asphaltic products. Apparatus consists of specified flask; condenser; adapter; shield; receiver; supports; all-brass adjustable Tirrill type burner with chimney; wire gauze; and A. S. T. M. Fahrenheit thermometer, range 30° to 760°. Complete with glassware and thermometer. **Each** **$22.50**

287M5 Distillation Apparatus, Liquid Asphaltic. Same as 287M4, except with A. S. T. M. Centigrade thermometer, range 0° to 400°. **Each** **$22.50**

287M6 Distillation Apparatus, Liquid Asphaltic. Same as 287M4, except without glassware. **Each** **$10.00**

287M7 Shields, Only. For distillation apparatus. With two mica observation windows; made of heavy galvanized iron with 1/8 inch thick asbestos riveted to the metal. A slit allows the side tube of the flask to protrude. The split cover is made of durable, high temperature Heat-Roc. **Each** **$5.00**

For thermometers, see page 286.

Cleveland Open Testers, Tag. A. S. T. M. D-92. For determining flash and fire points of lubricating oils and all products except fuel oil and those having open cup flash below 175° F. Complete with A. S. T. M. thermometer, range 20° to 760° F. in 5° graduations. Without test flame burner.

287M8 Cleveland Open Testers. With Bunsen burner. **Each** **$13.00**

287M9 Cleveland Open Testers. With alcohol burner. **Each** **$14.00**

287M10 Cleveland Open Testers. With electric heater, 550 watts. **Each** **$28.00**

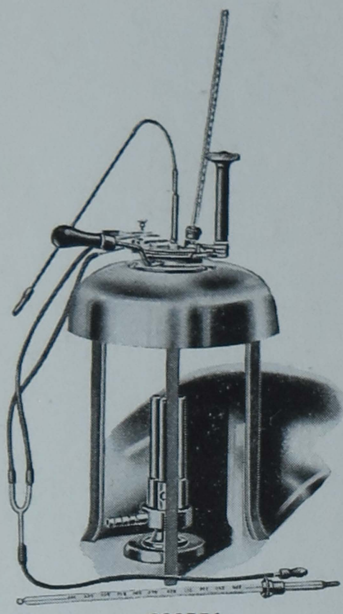
287M11 Cleveland Open Testers. With electric heater, 750 watts. **Each** **$46.50**

Accessories and Parts

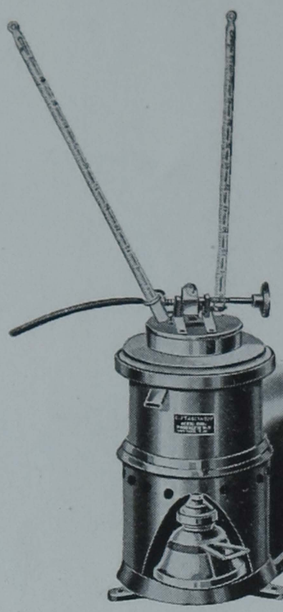
287M12 Bunsen Burner. Each	**$ .50**
287M13 Gas-Flame Testing Burner. Each	**$2.00**
287M14 Alcohol Burner. Each	**$1.50**
287M15 Alcohol Burner, Barthol Type. For very high flash and fire tests. **Each**	**$12.00**
287M16 Electric Heater. 550 watts. **Each**	**$16.50**
287M17 Electric Heater. 750 watts. **Each**	**$35.00**
287M18 Thermometer Clamp. Each	**$2.50**
287M19 Cup with Handle. Each	**$3.50**
287M20 Asbestos Plate. Each	**$ .40**
287M21 Metal Plate. Each	**$2.80**

For thermometers, see page 381M15.

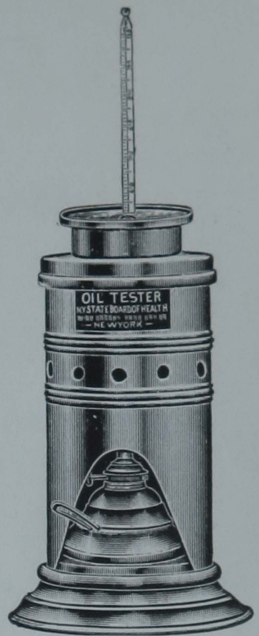
Oil Testing Apparatus, Continued



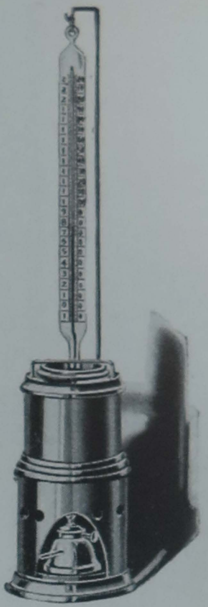
288M1



288M6



288M14



288M20

288M1 Closed Testers, Pensky-Martens, Tag. A. S. T. M. D-93. For flash point of fuel oils and other petroleum products. Complete with multiple gas burner, two A. S. T. M. thermometers, ranges 20° to 230° F. in 1° and 200° to 700° F. in 1°, respectively. **Each** **$75.00**

For thermometers, see page 381.

288M2 Cup with Handle. Each **$10.00**

288M3 Gas Burner. Each **$2.30**

288M4 Top. Complete with stirring mechanism. **Each** **$45.00**

288M5 Hood and Stand. Complete **$12.50**

Closed Testers, Tag. A. S. T. M. D-56. For flash point of kerosene and other volatile flammable liquids flashing below 175° F. Gas or oil may be used for the ignition flame by means of the same burner, using either the top supplied for gas or the wick supplied for oil.

288M6 Closed Testers, Tag, with Alcohol Burner. Complete with two Fahrenheit thermometers, range 20° to 230° in 1°. **Each** **$40.00**

288M7 Closed Testers, Tag, with Gas Burner. Otherwise same as 288M6. **Each** **$40.00**

288M8 Closed Testers, Tag, with Alcohol Burner. Complete with two Centigrade thermometers, range -7° to 110° in 1°. **Each** **$40.00**

288M9 Closed Testers, Tag, with Gas Burner. Otherwise same as 288M8. **Each** **$40.00**

For thermometers, see page 381.

288M10 Alcohol Burner. Each .... **$ .90**

288M11 Gas Burner. Each .... **$ .90**

288M12 Oil Cup. Each **$1.50**

288M13 Top. Complete. **$13.80**

Closed Testers, Elliott. For determining the flash and fire points of both high and low asphalts, petroleum spirits, illuminating oils and similar petroleum products. The top of the copper housing supports a copper water bath in which is suspended a removable copper test cup with glass cover. A notch in the cover admits the test flame, and an opening is provided for the thermometer. When flashing materials at or above the boiling point of water, the water bath is removed and replaced by an auxiliary copper cover from which the test cup can be suspended directly above the heating flame. Height to top of bath, 13 inches. Complete with thermometer, range 0° to 600° F. in 2°.

288M14 Closed Testers, Elliott, with Alcohol Burner. Each **$14.50**

288M15 Closed Testers, Elliott. With alcohol burner but without thermometer. **Each** **$12.00**

288M16 Closed Testers, Elliott, with Gas Burner. Each **$14.50**

288M17 Closed Testers, Elliott. With gas burner but without thermometer. **Each** **$12.00**

For thermometers, see page 381.

288M18 Test Cup, Copper. Each .... **$ 2.30**

288M19 Cover, Glass. For 288M17. **Each** .... **$ .90**

Open Testers, Tag. For determining the flash and fire points of illuminating oils. Complete with gas-flame testing burner, and glass enclosed paper scale thermometer, range 20° to 230° F. in 1°.

288M20 Open Testers, Tag, with Alcohol Burner. Each **$9.00**

288M21 Open Testers, Tag, with Gas Burner. Each . **$9.00**

For thermometer, see page 381M14.

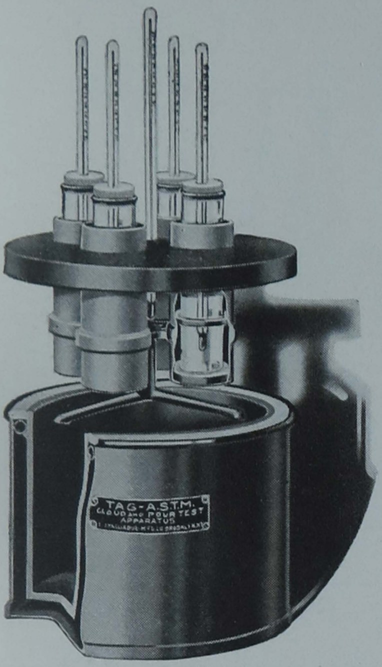
288M22 Alcohol Burner. Each .... **$ .90**

288M23 Gas Burner. Each .... **$ .90**

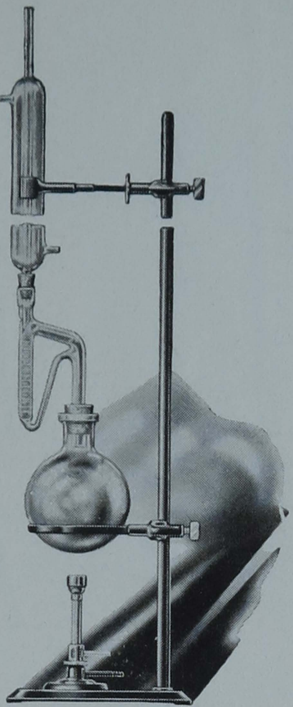
288M24 Oil Cup, Glass. Each .... **$ .30**

288M25 Support Wire for Thermometer. Each .... **$ .30**

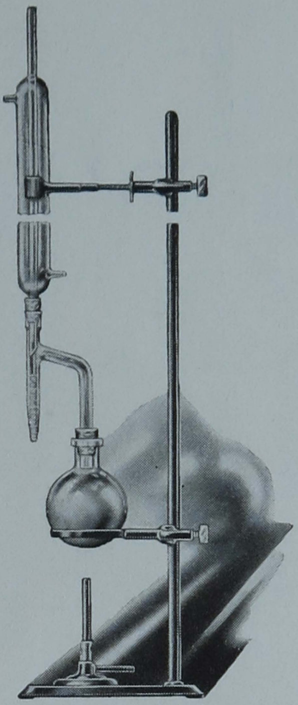
Oil Testing Apparatus, Continued



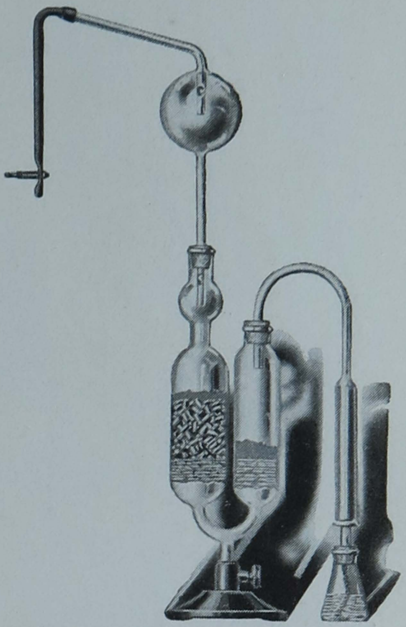
289M1



289M12



289M17



289M22

289M1 Cloud and Pour Test Apparatus, Single Compartment, Four-Unit, Tag. A. S. T. M. D-97. Complete with five A. S. T. M. thermometers, range -36° to +120° F. in 2°. **Each** **$27.50**

289M2 Insulated Cooling Bath Jar. Each **$6.00**

289M3 Wooden Cover. Each **$2.50**

289M4 Cloud and Pour Test Apparatus, Four Compartment, Sixteen-Unit, Tag. Each compartment is copper lined and insulated with 2-inch cork on sides and bottom. Complete with four removable Bakelite tops, fifteen A. S. T. M. thermometers, range -36 to +120° F. and five A. S. T. M. thermometers, range -70° to +70° F. in 2° **Each** **$121.50**

289M5 Cloud and Pour Test Apparatus, Four Compartment, Sixteen Unit, Tag. Same as 289M4, except without glass jars or thermometers. **Each** **$75.00**

289M6 Covers, Bakelite. Each **$1.50**

Accessories and Parts for 289M1 and 289M4

For thermometers, see page 381.

289M7 Unit of Four Metal Jackets on Stand. Complete **$5.75**

289M8 Cold Test Jar, Glass. Each .... **$ .25**

289M9 Cork Disc. For bottom of metal container. **Dozen** .... **$ .40**

289M10 Cork. For jar. **Dozen** .... **$ .40**

289M11 Washer, Leather. Dozen .... **$ .60**

289M12 Dilution Apparatus, Crank Case Oil, Tag. A. S. T. M. D-322. Complete with Pyrex flask, trap and condenser, Meeker type burner and ring support. **Each** **$13.00**

289M13 Glass Parts, Only. For 289M12. **Complete** **$7.15**

289M14 Trap, Pyrex. Each **$3.75**

289M15 Condenser, Pyrex. Each **$2.85**

289M16 Burner, Meeker Type. Each **$2.50**

289M17 Water Determination Apparatus, Dean Stark, Tag. A. S. T. M. D-95. For determining water in petroleum products. Consists of Pyrex flask, condenser and receiver, with Bunsen burner and supports. **Each** **$9.00**

289M18 Water Determination Apparatus, Tag. Same as 289M17, except with electric heater and supports.

Volts	110	220
Each	**$18.50**	**18.50**

289M19 Water Determination Apparatus, Tag. Similar to 289M17, except with metal still, special ring burner and support. **Each** **$23.00**
Note: For stills, see 297M1.

289M20 Distillation Flask, Pyrex. For use with water determination apparatus. **Each** .... **$ .38**

289M21 Receiver, Pyrex. For use with water determination apparatus. **Each** **$1.80**

289M22 Sulphur Determination Apparatus, Tag. A. S. T. M. D-90-T. For naphthas and illuminating oils. Complete with Pyrex glassware and metal base. **Each** **$9.75**

289M23 Absorber, Pyrex. Each **$3.90**

289M24 Chimney, Pyrex. Each .... **$ .50**

289M25 Spray Trap, Pyrex. Each **$1.55**

289M26 Lamp, Pyrex. Each .... **$ .18**

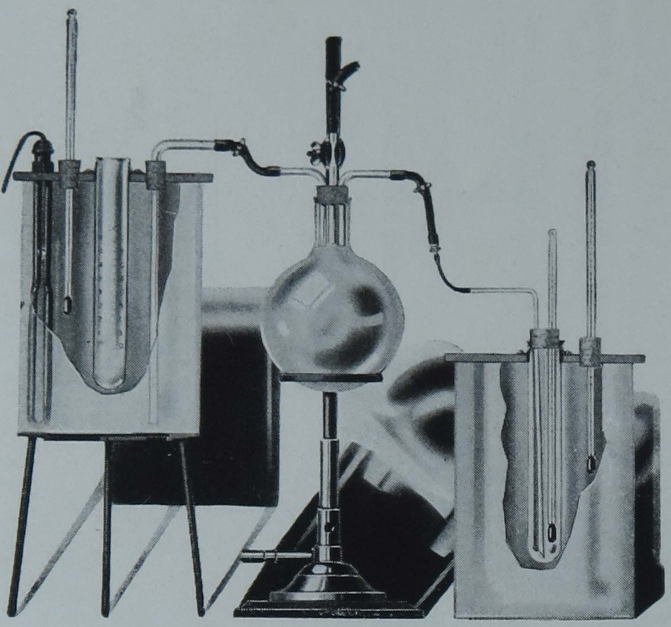
289M27 Beads. Supply for absorber .... **$ .80**

289M28 Metal Base. Each **$2.70**

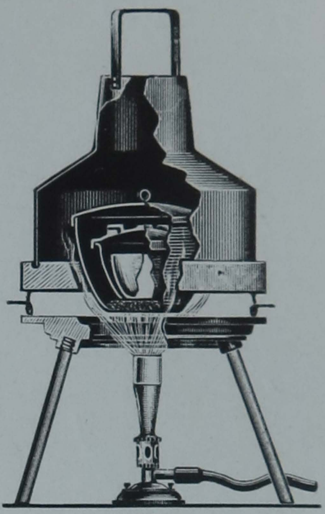
289M29 Wick Holder. Each .... **$ .12**

289M30 Cotton Wicks. Dozen .... **$ .15**

Oil Testing Apparatus, Continued



290M1



290M7

290M1 Steam Emulsion Apparatus, Tag. A. S. T. M. D-157. Suitable for use on all oils when an emulsion, demulsibility or emulsification test is required. Complete with three thermometers, range 30° to 220° F. in 1°, and 110-volt electric immersion heater, cord and plug. **Each** **$40.00**

290M2 Steam Emulsion Apparatus, Tag. Same as 290M1, except with 220-volt heater. **Each** **$40.00**
For thermometers, see 379M2 No. 51208.

290M3 Steam Delivery Tube. Each .... **$ .30**

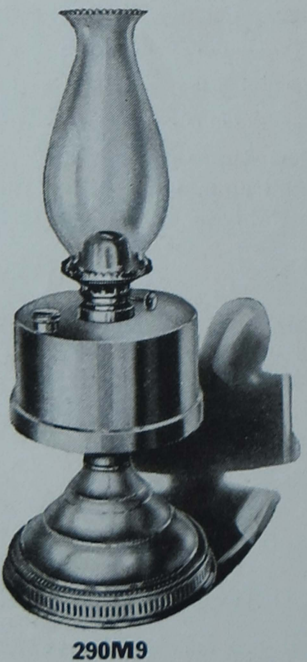
290M4 Glass Jar. Each **$2.00**

290M5 Flask. 1000 ml. **Each** .... **$ .55**

290M6 Test Tube, Special. Graduated. **Each** **$1.10**

290M7 Carbon Residue Apparatus, Tag. A. S. T. M. D-189. For determining the amount of carbon residue of lubricating oils. Complete with sheet iron hood, sheet iron block, iron crucible with cover, Skidmore crucible with cover, porcelain crucible, triangle, tripod and Meeker type burner. **Each** **$12.50**

290M8 Carbon Residue Apparatus, Tag. Same as 290M7, except with asbestos block in place of sheet iron block. **Each** **$12.50**



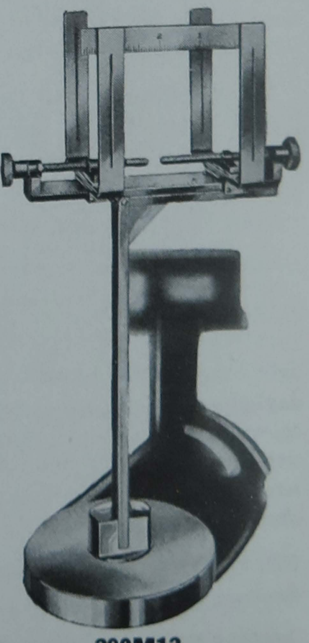
290M9

290M9 Testing Lamps, Standard, Saybolt, Tag. A. S. T. M. D-187. For burning test of illuminating oils. Complete with sun hinge burner and wick. **Each** **$10.00**

290M10 Wicks. Gross **$2.50**

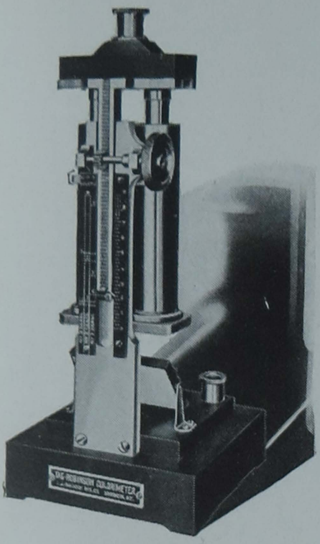
290M11 Chimney. Each .... **$ .50**

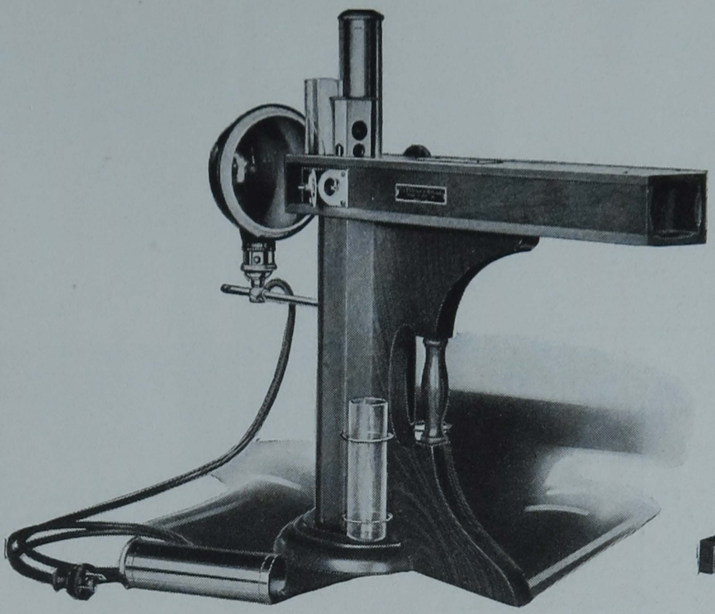
290M12 Gauges, Burning Test, Rather, Tag. A. S. T. M. D-187. Recommended for measuring the flame, height and width specified in the burning test for kerosenes and long-time burning oils. For use with Saybolt standard testing lamp, 290M9. **Each** **$60.00**

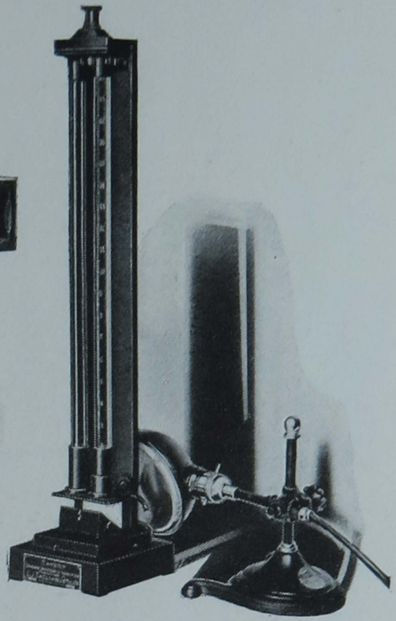


290M12

Oil Testing Apparatus, Continued


291M1


291M8


291M12 291M17

291M1 Colorimeters, Tag, Robinson. For determining the color shades of lubricating oils; operates on the principle of matching a variable depth of oil with a fixed color standard. Especially useful for plant control and for accurate differentiations of color shades. With N. P. A. color scale. Complete with three color standards, wooden carrying case and color table. Without daylight lamp. **Each**..............**125.00**

291M2 Color Standards. Specify No. 1, 2 or 3. **Each**..............**$12.50**

291M3 Tube. Without color standard or bottom cap. **Each**..............**$ .50**

291M4 Oil Immersion Tube. Complete..............**$5.00**
291M5 Oil Tube. Complete..............**$4.50**
291M6 Headpiece. Each..............**$27.50**
291M7 Mirror. With frame. **Each**..............**$5.70**

291M8 Colorimeters, Tag, Union. A. S. T. M. D-155-T and D-218-T. U. S. Government Method 10.22. For determining colors of lubricating oils and petrolatum. Operates on the principle of matching a fixed sample of oil with variable color standards. Complete with 12 color standards, standard glass jars and daylight lamp. **Each**..............**$173.25**
291M9 Color Standards. Specify number. **Each**....**$7.50**
291M10 Color Standards. Set of 12. **Set**..........**$90.00**
291M11 Glass Jars, Standard. Each..............**$ .50**

291M12 Chromometers, Saybolt, Tag, Standard Universal. A. S. T. M. D-156-T. U. S. Government Method 10.12. For determining the color shades of kerosene and gasoline. Operates on the principle of matching a variable depth of oil with a fixed color standard. Complete with three color standards, one ½ disc and 2 whole discs, wooden carrying case and color table. Without lamp. **Each**..............**$95.00**

291M13 Chromometers, Saybolt, Tag, Standard Universal. Same as 291M12, except without the ½ disc color standard. **Each**..............**$80.00**

291M14 Color Standards, Interchangeable. Each..**$15.00**

291M15 Color Standards, Special, ½ Disc. For determining the color shades of gasolines of higher color than 25 Saybolt chromometer. **Each**..............**$15.00**

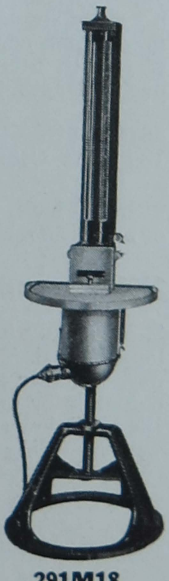
291M16 Tube, Plain. Without connection. **Each**....**$2.00**

291M17 Daylight Lamp, Macbeth, Tag. A. S. T. M. D-155-T, D-218-T and D-156-T. Designed especially for A. S. T. M. color determinations and is adjustable at any angle. For use with either the Robinson or Union colorimeter, or with the Saybolt Standard Universal chromometer. **Each**..............**$27.50**

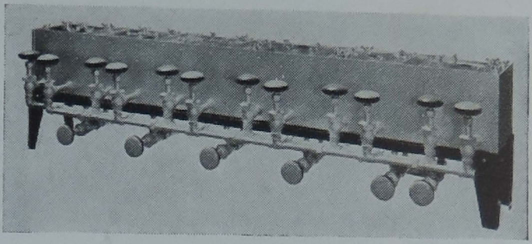
291M18 Colorimeter Stand and Daylight Illuminator, Tag. For use with either Tag Saybolt chromometer 291M12 or Tag Robinson colorimeter 291M1. The light source is the standard Tag Macbeth A. S. T. M. daylight lamp, and a diffusion screen is placed between the lamp and the instrument. The rays of light from the daylight lamp, instead of being reflected, pass directly up through the tube of the Saybolt chromometer or the colorimeter. The illuminator is so designed that all light is excluded except that coming from the lamp, and either the chromometer or the colorimeter can be used interchangeably. The color instruments are clamped to a removable base, and the instrument has an adjustable platform, thus it may be set to suit the height of the observer. Complete with Tag Macbeth daylight lamp. **Each**..............**$85.00**

291M19 Interchangeable Base. For either Tag Robinson colorimeter or Tag Saybolt chromometer. **Each**..............**$12.50**

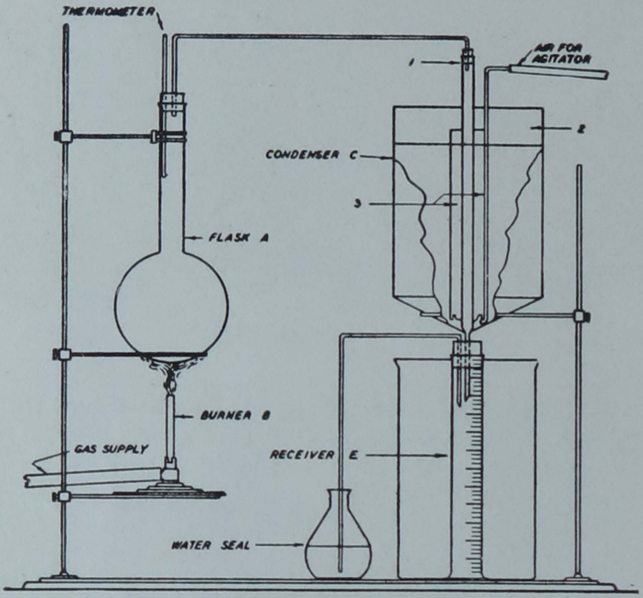
291M20 Daylight Lamp, Only, Macbeth, Tag. A. S. T. M. For use with 291M18. **Each**..........**$25.00**


291M18

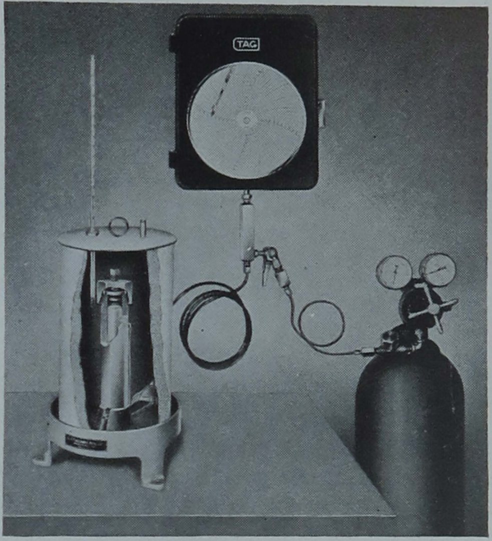
Oil Testing Apparatus, Continued



292M6



292M1



292M9

292M1 Charcoal Distillation Apparatus. For testing natural gas to determine its natural gasoline content in accordance with specifications of Testing Code, No. 101 of the American Gas Association and Natural Gasoline Association of America. Furnished complete with "Pyrex" distilling flask, vapor tube, copper condenser, receiver, bath jar, burner supports, necessary clamps, rubber tubing and A. S. T. M. thermometer, range 30° to 580° F. in 2°. **Each**..**$30.00**
For thermometers, see 381M5.

292M2 Condenser, Copper. With condenser tube and agitator. **Each**..**$17.50**

292M3 Distillation Bath Jar. A. S. T. M. D-86. Each..**$1.00**

292M4 Gas Burner. High temperature; adjustable. **Each**..**$2.00**

292M5 Stability of Gasoline Test Apparatus, Voorhees-Eisinger, Three-Unit. Measures the oxidation behavior of vapor-phase gasoline at 100° C. in terms of the induction period. An induction period of 400 minutes corresponds to approximately a year of storage life in vented iron barrels at atmospheric temperature—this expressed in terms of the time required to form 10 mg. of gum per 100 cc. by A. S. T. M.—which is deemed to be the maximum amount permissible for satisfactory service. Complete with 3-unit bath, steam heated, with individual control valves for steam, water and drain. Without glassware. Dimensions overall length, 28 inches; height, 15 inches; depth, 13 inches. **Each**..**$225.00**

292M6 Stability of Gasoline Test Apparatus, Voorhees-Eisinger, Six-Unit. Length, 58 inches; height, 15 inches; depth, 13 inches. Otherwise, same as 292M5. **Each**..**$295.00**

292M7 Flask, Pyrex, Voorhees-Eisinger. Heavy wall; round bottom. Capacity of flask, exclusive of the neck, 1000 ml. plus or minus 50 ml. Length of flask neck, 275 mm. plus or minus 25 mm.; diameter, 19 mm. plus or minus 1 mm. **Each**........**$1.50**

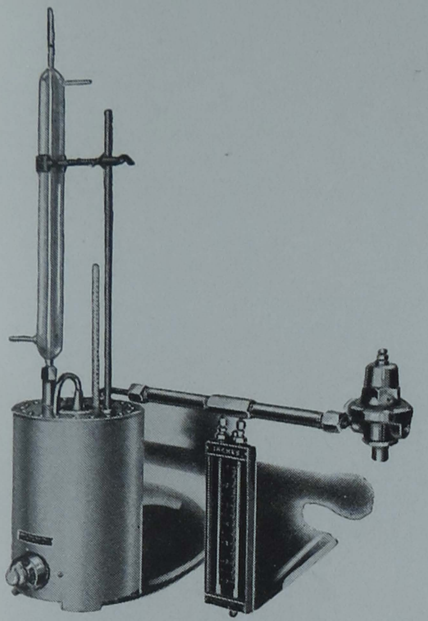
292M8 Recording Gauge, Three-Pen Type. For use-in conjunction with 292M5 and 292M6. **Each**................**$146.00**

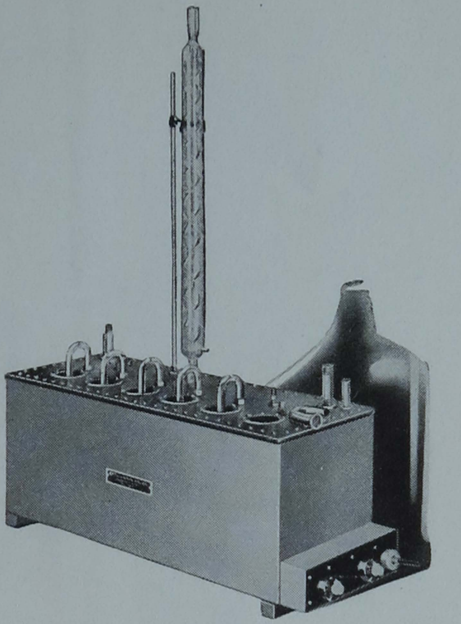
292M9 Gum Test Apparatus, Potential ,Tag. For "breakdown test." In this method a relatively small size bomb, 7¼ inches long, is used. The gasoline is measured into a test tube which fits in the bomb. The bomb is then heated by steam and is filled with oxygen under a pressure of 100 pounds per square inch. A recording pressure gauge records the pressure inside the bomb. The oxidation or breakdown point of the gasoline will lower the pressure sometimes very abruptly. The time which elapses before the breakdown or pressure lowering occurs, owing to the absorption of the oxygen, is a measure of the gasoline stability. Complete with recording pressure gauge, steam bath, bomb and accessories. Without oxygen tank or regulator. **Each**..........**$141.00**

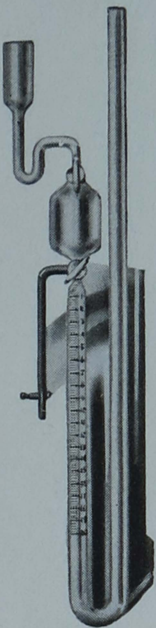
292M10 Gum Test Apparatus, Potential, Tag. Same as 292M9, except without recording pressure gauge. **Each**....**$75.00**

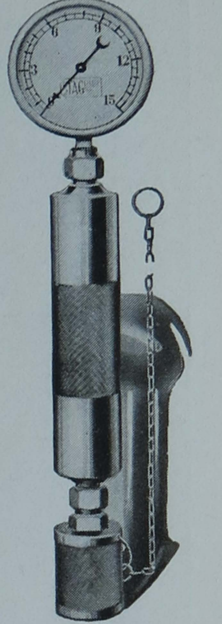
292M11 Recording Pressure Gauge, Tag. For use with 292M9 and 292M10. Range, 100 to 150 pounds in one-pound divisions. With 24-hour clock; in 10-inch rectangular black moisture-proof case. **Each**..**$66.00**

Oil Testing Apparatus, Continued


293M1


293M6


293M13


293M14

293M1 Gum Test Apparatus, Preformed, Tag, Single Unit. A. S. T. M. D-381. For a single determination of the amount of gum deposition which may take place in service if the motor fuel is used immediately; but gives no indication of gum stability of motor fuel upon storage. The gum bath is electrically heated and various degrees of heat may be obtained by moving the switch dial. A manometer type of flow meter has been constructed especially for this apparatus. Complete with bath; flow meter; reducing valve for the steady flow of air; thermometer, range 30° to 400° F. in 2°; and condenser.

Volts	110	220
Each	**$98.00**	**98.00**

293M2 Bath, Only.

Volts	110	220
Each	**$72.00**	**72.00**

For thermometers, see 379M2 No. 51241

293M3 Flow Meter. Each............. **$15.00** **15.00**

293M4 Reducing Valve 1/8-inch. **Each**............. **$5.00**

293M5 Condenser, Pyrex, Liebig Type. Each...... **$2.85**

293M6 Gum Test Apparatus, Preformed, Tag, Six-Unit. A. S. T. M. D-381. The bath is heated by a battery of six self-contained electric strip heaters. The constancy of the temperature is insured by the boiling liquid. Air flow to each sample is controlled by an accurately machined orifice at the inlet to each curved air delivery tube. The air flow is measured by a flow meter placed in the air line leading to the bath. Complete with accessories and thermometer.

Volts	110	220
Each	**$425.00**	**425.00**

293M7 Bath, Only.

Volts	110	220
Each	**$375.00**	**375.00**

293M8 Condenser, Pyrex, Allihn Type. Each...... **$3.90**

293M9 Flow Meter. Each........................ **$30.00**

293M10 Air Reducing Valve, Tag. 1/2-inch size. **Each**.. **$13.60**

293M11 Corrosion and Gum Test Dishes, Tag. U. S. Government Method 530.11. For determination of free sulphur, corrosive sulphur compounds and gum forming constituents of gasoline. Made of spun copper hemispherical in shape, 3½ inches in diameter, with a capacity of 150 to 160 milliliters. Weight, 50 to 60 grams. The edge of the dish is plain and not beaded. **Each**........................ **$ .60**

293M12 Copper Strips, Tag. A. S. T. M. D-130. For detection of free sulphur and corrosive sulphur compounds. Mechanically polished pure sheet copper; 1/2-inch wide; 3 inches long. **Dozen**.............................. **$1.00**

293M13 Vapor Pressure Apparatus, Robinson, Tag. For determination of the absolute pressure of gasoline vapor, the result being calculated from a known volume of air at atmospheric pressure, and the increased volume of the air-gasoline mixture, which increase in volume is due to the presence of saturated vapor of gasoline. Complete with pipette.
Each.. **$9.00**

293M14 Vapor-Pressure Bombs, Reid, Tag. A. S. T. M. D-323-T. For determining vapor-pressure of natural gasoline. Used when it is possible to fill gasoline chamber by immersing it in gasoline to be tested. Bomb consists of a lower cylinder or gasoline chamber connected to a larger upper cylinder, or air chamber, which is surmounted by a pressure gauge. Samples of vapor-pressure up to 12 pounds per square inch; absolute at 100° F., take a 0 to 15-pound gauge; with vapor pressure between 12 and 45 pounds, take 0 to 50-pound gauge. Complete without gauge.
Each.. **$20.00**

293M15 Vapor Pressure Bombs, Reid, Tag. Same as 293M14, except for sampling gasoline under pressure. Complete with valves; without gauge. **Each**............ **$30.00**
For water bath and air chamber thermometers, see page 381.

293M16 Pressure Gauge. Graduated 0 to 15 pounds in 0.1 pound. In brass case, nickel plated, with cover, and 4½-inch dial. **Each**...................................... **$10.00**

293M17 Pressure Gauge. Same as 293M16, except graduated 0 to 45 pounds in 0.2 pound. **Each**........... **$10.00**

293M18

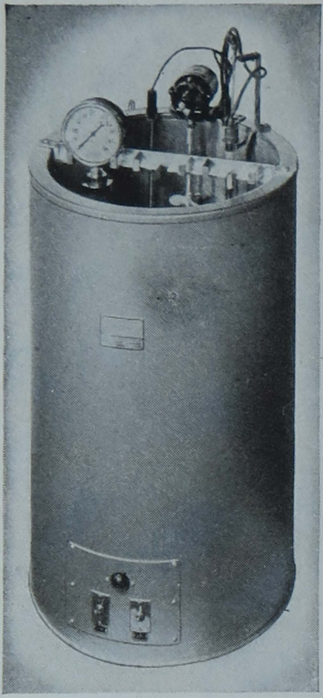
293M18 Acid Heat Test Apparatus for Gasoline A. S. T. M. D-481-T. Suitable for determining the acid heat of aviation and motor gasolines having Reid vapor pressures of 15 pounds or less. The method is indicative of the amount of unsaturated hydrocarbons in the gasoline that are reactive with sulphuric acid under the conditions of this test. Apparatus consists of a special vacuum bottle tested at 25-pound pressure, enclosed in a heavy brass chromium-plated case with screw cap containing holes for the thermometer and pressure-releasing tube and stopcock. Supplied with A. S. T. M. acid heat thermometer, range 30° to 220° F. in 1°; pressure releasing tube with stopcock; and two-hole rubber stopper. **Each**.. **$12.50**

For thermometer, see 381M1.

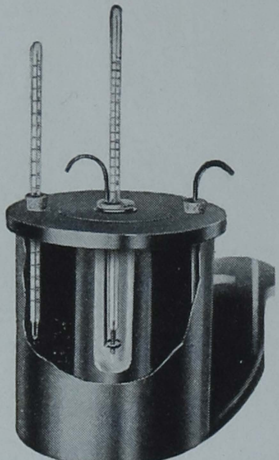
293M19 Thermos Bottle, Calibrated. Each........ **$7.00**

293M20 Pressure Releasing Tube and Stopcock. Complete.. **$1.50**

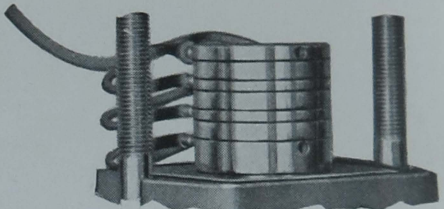
Oil Testing Apparatus, Continued



294M1



294M3



294M5

294M1 Baths, Constant Temperature, for Reid Bombs. For immersion of Reid bombs in a constant temperature bath at a temperature of 100° F. plus or minus 0.2° F. Bath is of all-metal, double-walled construction, with interior of tin-lined copper and exterior of galvannealed iron coated with metallic aluminum spray. Bombs are suspended from a tinned copper cross bar in which they are inserted easily, and can be removed easily. Beneath the bath walls is a heavy thickness of thermal insulation to insure temperature uniformity and a motor-driven propeller stirrer agitates the heating medium for uniform circulation around all of the bombs. Patented Low-drift immersion heater of low wattage per unit length insures instant thermal response, operation being governed by a sensitive relay. No auxiliary current source is needed as the relay operates directly on the line current. A Neon pilot lamp signals operation of the heater. The bath has two switches, one controlling the line current, the other the stirrer. Overall dimensions of the bath: diameter, 19½ inches; height, 32 inches. Complete without bombs.

Volts	110	220
Each	**$175.00**	**175.00**

294M2 Baths, Constant Temperature, for Reid Bombs. Same as 294M1, except with angle ring around upper rim for flush mounting suspension in table top opening. Relay pilot lamp and control switches are located in a separate box.

Volts	110	220
Each	**$175.00**	**175.00**

294M3 Paraffin Wax Melting Point Apparatus, Tag. A. S. T. M. D-87. For testing the melting point of paraffin wax. Complete with A. S. T. M. thermometer range 80° to 160° F. in $\frac{1}{5}$°, and etched stem thermometer, range 30° to 220° F. in 1°. **Each** **$25.00**

For thermometers, see 381M29 and 379M2 No. 51208.

294M4 Test Tubes, Graduated, Special. For use with 294M3. **Each** . . . . **$ .50**

294M5 Wax Test Apparatus, Oil and Moisture in Paraffin. A. S. T. M. D-308-T. For use with laboratory press in determining expressible oil and moisture in paraffin by noting the loss in weight resulting from compression. Applicable to crude, semi-refined, and refined paraffin waxes melting at or about 108° F. Complete with three ring molds and brass plate. Without press. **Each** **$40.00**

294M6 Wax Test Apparatus, Oil and Moisture in Paraffin. Same as 294M5, except consists of the top platen and ring and the bottom platen with one ring mold and brass plate. Without press. **Each** **$20.00**

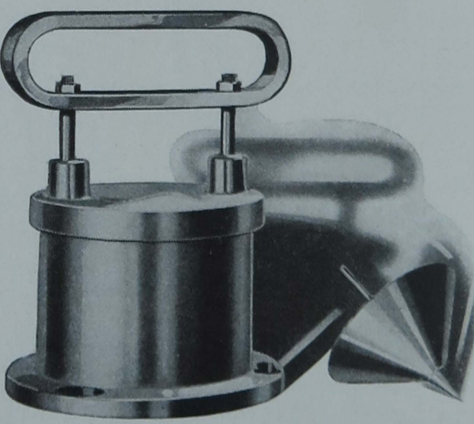
For hydraulic press, see page 323.

294M7 Intermediate Sections.. Ring and platen with ring mold and plate. **Complete** **$10.00**

294M8 Brass Plate, Only. Each . . . . **$ .30**

294M9 Set of Three Ring Molds. Set **$1.00**

294M10 Cloth Discs. Diameter, 3.5 inches. **Package** of 100 . . . . **$1.50**



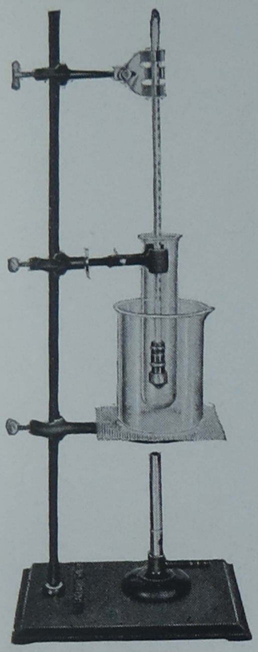
294M11 294M12

294M11 Grease Workers. A. S. T. M. D-217-T. Used to bring grease to a uniform consistency before testing. **Each** **$28.50**

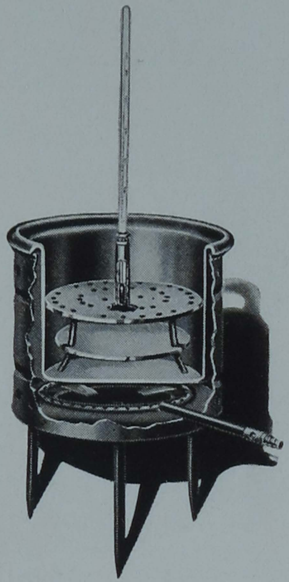
294M12 Grease Cones. A. S. T. M. D-217-T. Standard. For replacing penetration needle on standard penetrometer. **Each** **$20.00**

For penetrometers, see page 309.

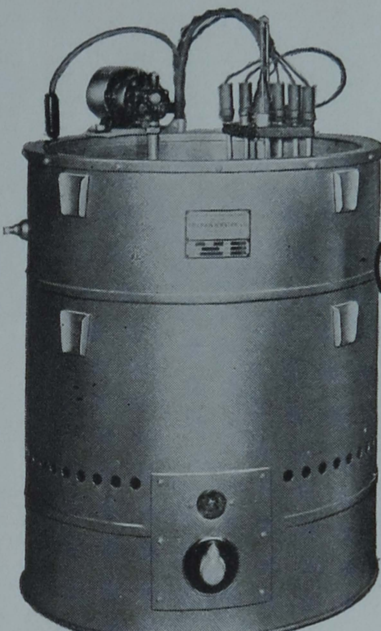
Oil Testing Apparatus, Continued



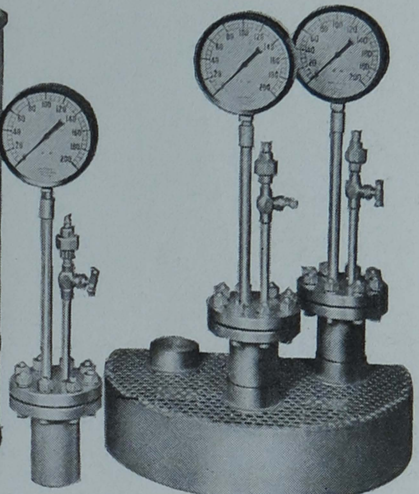
295M1



295M4



295M6



295M7

295M1 Dropping Point of Lubricating Greases Apparatus. Method is described in the A. S. T. M. 1937 Report of Committee D-2 on Petroleum Products and Lubricants. It is a modification of the Ubbelohde dropping point method. Complete with thermometer, range 20° to 580° F.; 600 ml. beaker in which test tube is immersed; test tube, 4 cm. by 18 cm. for including sample; rod and base support ring stand and clamp for test tube; support for the beaker; and gas burner. **Each**............... **$15.00**

295M2 Dropping Point of Lubricating Greases Apparatus. Same as 295M1, except with thermometer range -5 to 300° C. **Each**............... **15.00**

295M3 Grease Cup Assembly, Only. Each............... **$5.00**
For thermometers, see 381M21 and 381M24.

295M4 Petrolatum Melting Point Apparatus, Tag. For testing the melting point of petrolatum. Consists of a circular brass plate, divided into four sectors, each containing ten well-holes of equal depth. Simultaneous testing of four samples is permitted by this division. In testing, the ten well-holes of a sector are filled with melted petrolatum. The petrolatum is scraped level and upon solidification standard pine sticks are placed upright in the center. This plate is then immersed in a cold water bath, heated at a prescribed rate, and as the critical point is reached, the pine sticks are released and rise to the surface of the water bath. Thermometer readings are taken as the third, fourth, fifth, sixth, seventh, and eighth sticks reach the surface. Complete with thermometer, range 90° to 150° F. in ½°. **Each**............... **$26.80**

295M5 Standard Pine Sticks. Package of 100............... **$2.00**
For thermometers, see 381M30.

295M6 Stability of Lubricating Greases Apparatus, Norma-Hoffman. For determination of definite storage stability characteristics for lubricating greases, either in terms of the number of hours for the induction period or the rate of oxygen absorption in ml. per hour during the induction period. Apparatus consists of constant temperature bath with removal metal rack for three bombs. Interior is of tin-lined copper; exterior, of galvannealed iron coated with metallic aluminum spray; heavily insulated to insure temperature uniformity. A motor-driven propeller stirrer agitates the heating medium for uniform circulation around the bombs; patented low-drift immersion heating units of low wattage per unit length insure instant thermal response. Operation of the control heater is signalized by a Neon pilot light and governed by a sensitive mercury thermo-regulator working in conjunction with a super-sensitive relay concealed inside the bath housing. Overall dimensions, 18 inches in diameter; 21½ inches in height. For A. C. or D. C. Without bombs or pressure gauges.

Volts...............	110	220
Each...............	**$195.00**	**195.00**

295M7 Grease Stability Bomb. Constructed of SAE No. 1020 forged steel, hot-tinned throughout. Includes stainless steel dish holders, needles, unions and Hoke needle valves. Without pressure gauge. **Each**............... **$62.50**

295M8 Grease Stability Bomb. Stainless steel. Otherwise same as 295M7. **Each**............... **$84.50**

295M9 Pressure Gauge. Diameter, 4½ inches. Range of 150 pounds in 1-pound divisions. Accuracy, ½ of 1%. **Each**.. **$3.00**

Oil Testing Apparatus, Continued

DULIN ROTAREX
BRAUN

296M1

Separators, Rotarex, Dulin. For determining bitumen content and the character and relative proportions of the aggregates in asphaltic mixtures. An aluminum bowl is mounted on the head of a vertical shaft, which is either hand or motor driven and carries a heavy fly-wheel, just below the bowl, to balance the load. This bowl is held in place by the filler screw in the center—a funnel-shaped piece which screws into the head of the power shaft. This screw also fastens the cover of the bowl and serves as an inlet for additional solvent as the test proceeds. A filter paper gasket is used between the cover and the bowl. Surrounding the bowl is a covered aluminum catch-basin draining to a spout so that the solvent may be recovered.

296M1 Separators, Rotarex, Dulin, Hand Driven. Designed for making determinations on the job. Driven by a hand crank through a chain of hand-fitted machine-cut gears so that a high speed can be maintained without vibration.

Capacity, grams	**50**	**100**	**500**
Height, inches	12	12	17
Diameter, inches	11	11	11
Weight, net, pounds	30	30	50
Weight, shipping, pounds	55	55	75
Each	**$60.00**	**65.00**	**130.00**
296M2 Aluminum Bowl. Each	**$ 6.00**	**10.00**	**16.00**
296M3 Cover for Bowl. Each	**$ 2.25**	**4.00**	**6.50**
296M4 Filler Screw. Each	**$ 1.00**	**1.00**	**3.00**
296M5 Filter Rings. Hundred	**$ 2.00**	**2.75**	**4.00**

296M6 Separators, Rotarex, Dulin, Motor Driven. For laboratory work. Will operate on 110 volts, A. C. or D. C. Furnished with a separate rheostat to permit of variable speeds. By inserting a suitable resistance, it can be operated also on 220 volts.

Capacity, grams	**50**	**100**	**500**	**1000**
Height, inches	15	15	22	22
Diameter, inches	14	14	14	14
Weight, net, pounds	25	30	110	110
Weight, shipping, pounds	45	45	165	165
Each	**$90.00**	**95.00**	**170.00**	**175.00**
296M7 Aluminum Bowl. Ea.	**$6.00**	**10.00**	**16.00**	**20.00**
296M8 Cover for Bowl. Each	**$2.25**	**4.00**	**6.50**	**7.50**
296M9 Filler Screw. Each	**$1.00**	**1.00**	**3.00**	**3.00**
296M10 Filter Rings. Hundred	**$2.00**	**2.75**	**4.00**	**5.00**

296M11

Centrifuges, Oil, Motor Driven, Improved, Semi-Enclosed Type, Four-Tube Head. For testing oils. The special sparkless motor is adequately protected and substantially mounted in a housing in a centrifuge base. It is ball-bearing, has no commutator, brushes nor similar devices ordinarily used, thereby eliminating the possibility of arcing with the consequent danger of igniting inflammable or explosive vapors. The motor is single-phase, but can be operated on a three-phase circuit by connection to any two wires of the three-phase line. Centrifuge is regularly furnished with single-phase sparkless motor for 60 cycles A. C., slow starting switch, four-tube head, and set of four 100-ml. graduated glass tubes.

Dimensions: height, 19 inches; diameter of guard, 24 inches.

Weight: net, 115 pounds; shipping, 200 pounds.

296M11 Centrifuges. Motor driven, improved, semi-enclosed type, four-tube head, 110-volt. **Each** **$180.00**

296M12 Centrifuges. Motor driven, improved, semi-enclosed type, four-tube head, 220-volt. **Each** **$180.00**

Centrifuges, Oil, Motor Driven, Enclosed Type, Four-Tube Head. Similar to 296M11. Designed particularly for dangerous volatile liquids, eliminating danger of ignition of inflammable or explosive gases. Housing is of sheet metal, with aluminum top with hinged door for easy access, all mounted solidly on broad cast iron base. Complete with single-phase sparkless motor for 60 cycles A. C., slow starting switch, four-tube head and four 100-ml. graduated glass tubes.

296M13 Centrifuges. Motor driven, enclosed type, four-tube head, 110-volt. **Each** **$240.00**

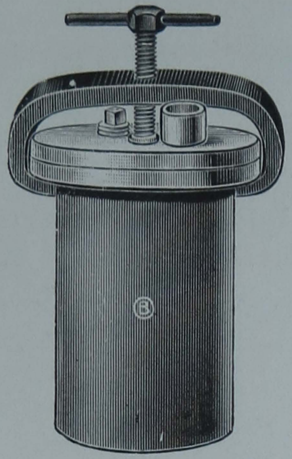
296M14 Centrifuges. Motor driven, enclosed type, four-tube head, 220-volt. **Each** **$240.00**

Centrifuges, Oil, Motor Driven, Enclosed Type, Eight-Tube Head. Similar to 296M13. Complete with three-phase sparkless motor for 60 cycles A. C., slow starting switch, eight-tube head, and set of eight 100-ml. graduated glass tubes.

296M15 Centrifuges. Motor driven, enclosed type, eight-tube head, 220-volt. **Each** **$295.00**

296M16 Centrifuges. Motor driven, enclosed type, eight-tube head, 440-volt. **Each** **$295.00**

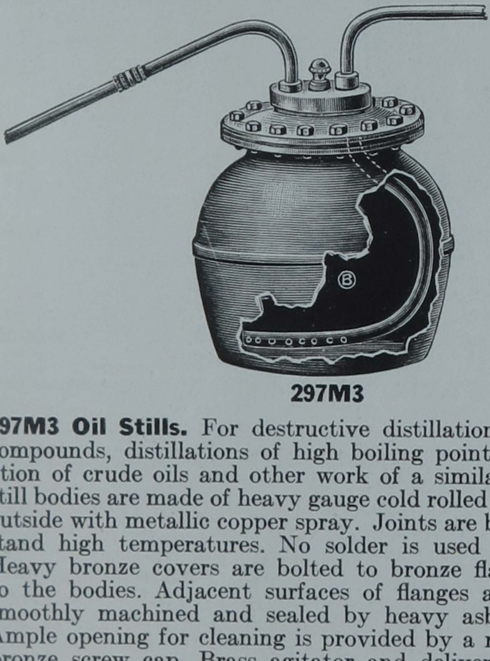
Oil Testing Apparatus, Continued



297M1

297M1 Tar Stills, Small. A. S. T. M. D-95 and D-370. Constructed of seamless copper tubing more than ⅛ inch thick, with bottom and faced-flange rim brazed in to withstand high temperatures. Cover and over flange are cast bronze with adjacent surfaces smoothly machined. Cover, with thermometer well and brass screw plug in vapor opening seats against an asbestos gasket, clamped by a forged steel yoke, with steel clamping screws. Diameter, inside, 3½ inches; height, inside, 6 inches. Capacity, about one quart. **Each**..**$15.50**

297M2 Tar Stills, Large. Same as 297M1, except diameter inside, 5 inches; height, inside, 7½ inches. Capacity, approximately one gallon. **Each**....................**$23.50**



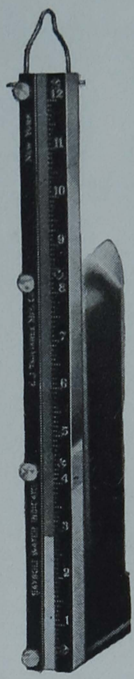
297M3

297M3 Oil Stills. For destructive distillations of asphaltic compounds, distillations of high boiling point oils, fractionation of crude oils and other work of a similar nature. The still bodies are made of heavy gauge cold rolled copper, coated outside with metallic copper spray. Joints are brazed to withstand high temperatures. No solder is used at any point. Heavy bronze covers are bolted to bronze flanges fastened to the bodies. Adjacent surfaces of flanges and covers are smoothly machined and sealed by heavy asbestos gaskets. Ample opening for cleaning is provided by a removable cast bronze screw cap. Brass agitator and delivery tubes screw into the cover, which is equipped with a leak-proof stuffing box to accommodate a thermometer. Delivery tube may be lengthened by means of an extension tube and screw coupling which are included.

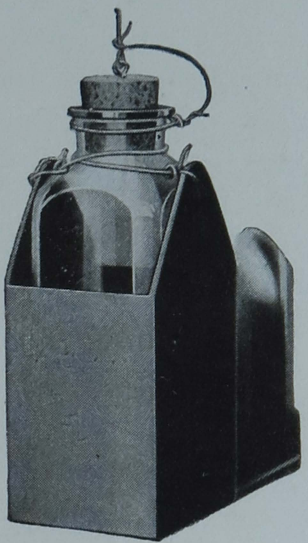
The stills may be used in two ways: (1) By introducing live steam through the inlet tube, which is perforated along its lower arm to direct the vapor against the retort bottom for heating and agitating the material; and (2) by plugging the opening for the agitator tube with the brass screw plug, included for the purpose, and applying flame heat.

Capacity, gallons....	½*	1	2	3	5
Height of body, inches.	6	8	11	13	15
Diam. of body, inches.	6	8	10¼	11½	12
Diam. of opening, ins..	2⅞	2⅞	2⅞	2⅞	2⅞
Each..............	**$18.50**	**28.00**	**40.00**	**50.00**	**60.00**

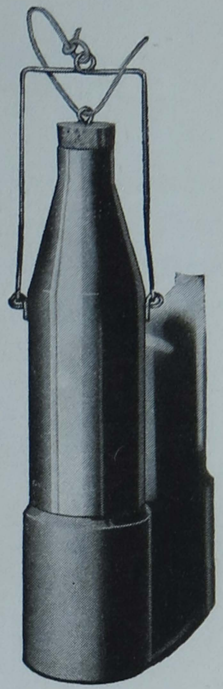
*Cylindrical form



297M4



297M6



297M9

297M4 Water Indicator and Oil Sampler, Tag. With 50 paper strips. Consists of a 12-inch sampling tube, carrying on one side a graduated scale, to which strips of orange-colored prepared paper are attached readily. Contact with water turns the paper white, indicating the depth of the water. **Complete**..**$9.60**

297M5 Indicator Paper Strips. Dimensions, 12x⅜ inches. **Hundred**..**$1.30**

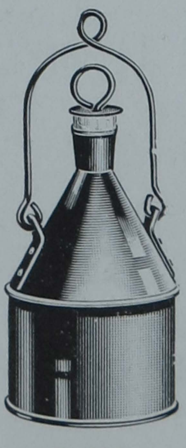
297M6 Sampling Device, Weighted Bottle, Tag. A. S. T. M. D-270. For sampling heavy lubricating oils, light lubricating oils, kerosene, gasoline, transparent gas oils, etc. Capacity, one quart. Height, 7⅝ inches without neck. Opening, 1½ inch. **Each**..**$6.50**

297M7 Bottle, Only. Each........................**$ .50**

297M8 Weight, Only. Each........................**$6.00**

297M9 Sampling Device, Weighted Beaker, Tag. A. S. T. M. D-270. For sampling heavy crudes, Diesel fuels, fuel oils, and non-transparent gas oils. Capacity, over a quart. Height, 13¾ inches without handle.

Size of opening, inches..................	¾	1½
Each..............................	**$17.50**	**17.50**



297M10

297M10 Oil Sampler, Barrett Form. Constructed of heavy galvanized iron to withstand severe use. Lead weighted at the bottom with heavy iron trunnions riveted on. Heavy steel wire handle. Cork stopper faced top and bottom with metal discs. Capacity, approximately ⅓ gallon. Height, 12 inches. Diameter, 5⅜ inches. **Each**..............................**$7.50**

Oil Testing Apparatus, Continued

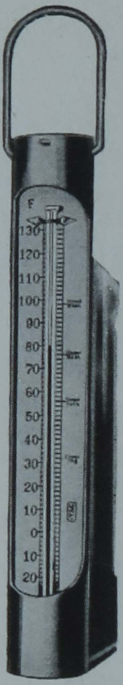
298M1

298M1 Drum Thieves. Metal. Suitable for 50-gallon drum containers. Length, 36 inches; diameter, 1¾ inches. **Each**..$10.00

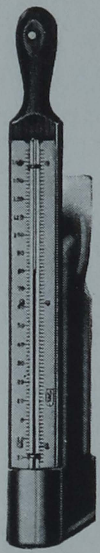
298M2 Oil Thieves, Glass. Improved form with rubber bumper. Length, 30 inches. **Each**........$1.80

298M3 Oil Thieves. Same as 298M2, except length, 36 inches. **Each**........$2.50

298M4 Oil Thieves. Same as 298M2, except length, 38 inches. **Each**........$3.00



298M5



298M7

298M5 Cup Case Thermometers, Cylindrical, Tag. Standard Grade. With closed bottom.

Thermometer, number	8669	8670	8671	8672
Range, degrees, F., approximate	– 20 to +120	– 20 to 120	+20 to 220	+20 to 220
Length, inches	10	12	10	12
Diameter, inches	1	1¾	1	1¾
Each	**$2.00**	**2.88**	**$2.00**	**2.88**

298M6 Extra Tube and Scale. For 298M5.

For thermometer, number	8669	8670	8671	8672
Each	**$1.00**	**1.13**	**1.00**	**1.13**

298M7 Cup Case Tank Thermometers, Metal Scale, Tag. Wood back. With brass cup.

Thermometer number	57160	57161	57162	57165	57166	57167
Range, degrees, F., approximate	– 20 to +120	– 20 to +120	– 20 to +120	+20 to 220	+20 to +220	+20 to 220
Length, inches	8	10	12	8	10	12
Each	**$1.05**	**1.50**	**2.00**	**1.05**	**1.50**	**2.00**

Note: 298M7 thermometers can be furnished with red back at no additional charge. When ordering, specify "Red Back" after number.

298M8 Cup Case Tank Thermometers, Etched Stem, Tag. Same as 298M7, except graduations etched on thermometer stem.

Thermometer number	57200	57202	57204	57210	57212	57214	57216
Range, degrees, F., approximate	- 20 to +120	– 20 to +120	– 20 to +120	+20 to 220	+20 to 220	+20 to 220	0 to 180
Length, inches	8	10	12	8	10	12	12
Each	**$1.38**	**1.84**	**2.34**	**1.38**	**1.84**	**2.34**	**2.50**

298M9 Etched Stem Thermometer Tubes, Only. For 298M8.

For thermometer, number	57200	57202	57204	57210	57212	57214	57216
Each	**$ .80**	**1.25**	**1.75**	**.80**	**1.25**	**1.75**	**1.90**

For other thermometers, see pages 378 to 389, inclusive.

Ore Testing Apparatus

299M2

Ball Mills, Laboratory, Batch Type. Closed. For fine grinding in laboratory flotation work, wet grinding is necessary in several stages in order to approximate the actual grinding conditions of a ball mill and classifier in plant operation. With this machine it is possible to grind successfully in several stages without dilution, because the large feed-opening and small discharge hole, which retains the balls while the mill is being discharged, permits quick and thorough draining with the use of a minimum of wash water. A batch classifier is often used in conjunction with a batch ball mill to save time in thickening and screening pulp.

Machine size, 15x10 inches. Capacity, 9 kg. H. P. required, ½. Complete with a 55-pound charge of assorted alloy steel grinding balls.

With Stand. Dimensions: 54x49x46 inches.

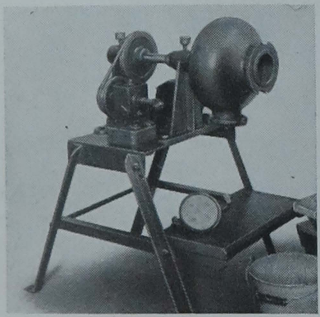
299M1 Ball Mills, Motor Driven. Shipping weight, 895 pounds. **Each** **$215.00**

299M2 Ball Mills, Belt Driven. Shipping weight, 700 pounds. **Each** **$175.00**

Without Stand. Dimensions: 48x19x26 inches.

299M3 Ball Mills, Motor Driven. Shipping weight, 665 pounds. **Each** **$140.00**

299M4 Ball Mills, Belt Driven. Shipping weight, 470 pounds. **Each** **$100.00**



299M5

Ball Mills, Laboratory, Batch Type. Open. In order to make laboratory tests check with plant results, it is often necessary to have air present in the grinding mill. This is particularly true when handling massive sulphide ores. The open end design permits air to enter during grinding. The grinding drum is made of cast steel, and is arranged also with a plug for quick draining without removing the grinding balls.

Many of these mills are being used as clean-up mills for the amalgamation of table and flotation concentrates. In this application a uniform product can be produced with a single large grinding ball.

Machine size, 12x5 inches. Capacity, 2 kg. H. P. required, ¼. Complete with 25-pound charge of assorted alloy steel grinding balls.

With Stand. Dimensions: 39x25x42 inches.

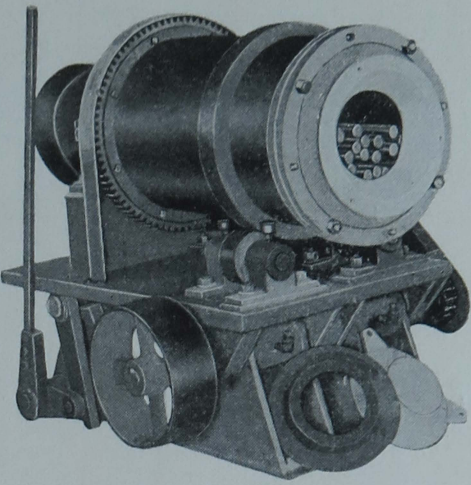
299M5 Ball Mills, Motor Driven. Shipping weight, 440 pounds. **Each** **$140.00**

299M6 Ball Mills, Belt Driven. Shipping weight, 315 pounds. **Each** **$105.00**

Without Stand. Dimensions: 30x19x18 inches.

299M7 Ball Mills, Motor Driven. Shipping weight, 380 pounds. **Each** **$115.00**

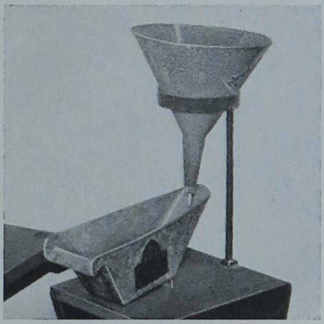
299M8 Ball Mills, Belt Driven. Shipping weight, 280 pounds. **Each** **$80.00**



299M9

299M9 Ball and Rod Mills, Laboratory, Marcy. For grinding wet or dry ore in testing plants and educational institutions. Efficient for either batch or continuous work. A wooden plug is provided to be inserted in the discharge bell when batch grinding. A grid is supplied when steel balls are used. All mills are right-hand, rotating clockwise, and have a single scoop feeder.

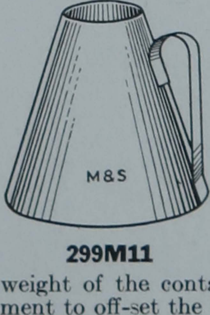
The capacity is determined by character of material, size of feed, rate of feed, etc. The approximate capacity per hour of continuous grinding of ½-inch feed to 20 mesh is 75 pounds. H. P. required is 1½. Speed, 35 R. P. M. Size of grinding compartment, 12x24 inches. Overall size, 38x33x30 inches. Weight of the mill, 1100 pounds. Pulley, 10x3½ inches. Without balls or rods. **Each** **$375.00**



299M10

299M10 Classifiers, Laboratory, Batch Type. Used to classify or settle the pulp from laboratory batch ball mills, and the results approximate the work done by standard commercial classifiers placed in closed circuits with ball or rod mills.

Unit consists of a funnel with a variable spigot discharge through which the material passes into the hopper-shaped tank. The size of the overflow material is controlled by the slope of the tank and the size of the spigot opening in the bottom of the funnel. As the pulp passes into the tank the sands settle to the bottom and the slimes overflow at the discharge lip. Recommended for classifying 100, 150, or 200 mesh, and as additional equipment for use with batch ball mills. Shipping weight, 10 pounds. **Each** **$5.00**

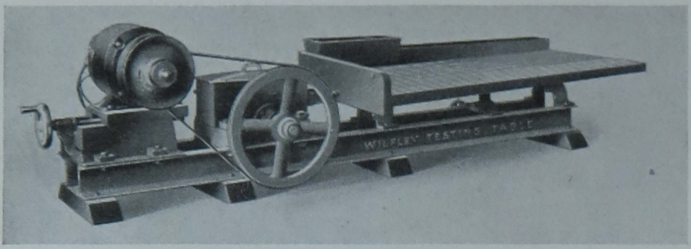


299M11

299M11 Pulp Sample Cans. Used to determine the specific gravity of ore pulp by filling and weighing. The scale or other weighing device must be adjusted to offset or counter-balance the tare weight of the empty container. Made of sheet copper. Capacity, one liter. **Each** **$3.00**

299M12 Pulp Sample Cans with Tare Weight. Same as 299M11, except furnished with a tare weight, matched with the can and used to counter-balance the weight of the container. Used on scales having no arrangement to off-set the tare weight of the can. **Each** **$4.00**

Ore Testing Apparatus, Continued



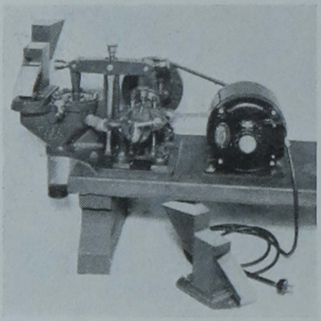
300M1

300M1 Concentrating Tables, Laboratory, Wilfley, No. 13. Developed to meet the demand for a laboratory concentrating table that will approach within close limits, on a small scale test, the work of the large-sized tables. Contains all of the important mechanical and operating features of the larger table, such as the enclosed self-oiling head motion, improved draw bars, positive tilting devices, etc.

Two interchangeable decks, 40x18 inches are supplied: one riffle for concentration of fine feeds, and the other for the concentration of coarse feeds. Equipped also with separate feed and water boxes similar to those on the larger tables.

Complete with variable speed V-belt motor drive.
Each **$180.00**

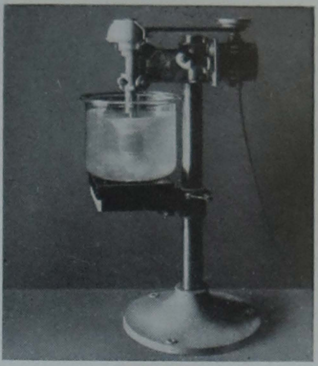
300M2 Concentrating Tables, Laboratory, Wilfley, No. 13. Without variable speed V-belt motor drive. Otherwise same as 300M1. **Each** **$135.00**
Note: 300M1 and 300M2 can be supplied also with single deck, 50x24 inches, for special work. Prices on application.



300M3

300M3 Mineral Jigs, Laboratory, Motor Driven, Batch Type. For the removal of free coarse mineral values. It has a screen size of 1½x2¼ inches and was designed for use with samples as small as 2000-gram. A sample this size can be jigged with a resulting pulp which will require additional dilution for subsequent flotation tests. A rotating water valve timed to admit water only on the plunger upstroke is mounted on the end of the eccentric shaft which by means of a walking beam actuates the rubber diaphragm sealed plunger. The screen compartments, of which two are provided, are removable. The hutch compartment is cast iron, sand blasted, and finished with baked enamel to provide a smooth, easily cleaned surface inside and out. A detachable glass concentrate jar makes the operation visible. A siphon arrangement is provided so that the jar can be removed without spillage. Since cast iron is used throughout, cyanide solution can be substituted for the water ordinarily used. H. P. required, ⅙. Capacity, 20 to 25 pounds per hour. Dimensions: length, 24 inches; width, 14 inches; height, 17 inches. Shipping weight, 120 pounds. **Each** **$175.00**

300M4 Mineral Jigs, Laboratory, Belt Driven. Shipping weight, 105 pounds. Otherwise same as 300M3.
Each **$150.00**



300M5

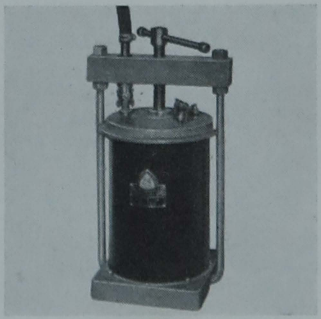
Pulp Agitators, Laboratory, Wallace, Batch Type, Single Unit. Used in problems involving agitating, mixing and conditioning of various pulps. Can be utilized for cyanide, flotation, industrial and chemical processes where a compact, flexible, efficient and easily cleaned unit is required for batch work. Agitation is provided by a rotating propeller which draws the pulp down a central stainless steel standpipe, thoroughly mixing and diffusing it with air.

Three sizes of heavy cast spherical bottom Pyrex jars and two agitators are furnished as standard equipment with the single unit. These jars have a capacity of 1.75 gallons (6.62 liters), 3.37 gallons (12.75 liters) and 5.03 gallons (19.03 liters).

Multiple agitator units are available when it is necessary to agitate several pulps simultaneously. Any number of units can be mounted on a single base, with individual rubber covered supports, and driven by V-belts from a common line shaft and motor.

H. P. required, ¼.

Size	**1 unit**	**2 unit**
Length, inches	25	15
Width, inches	15	30
Height, inches	47	29
300M5 Pulp Agitators, Motor Driven.		
Weight, shipping, pounds	330	450
Each	**$160.00**	**230.00**
300M6 Pulp Agitators, Belt Driven.		
Weight, shipping, pounds	200	360
Each	**$160.00**	**185.00**



300M7

300M7 Pulp Sample Filters, Pressure, Laboratory. For dewatering mill samples. Its safety air coupling device makes it particularly valuable for use in universities, schools and test plants. Because of an ingenious arrangement of the yoke, it is impossible to open the filter without first releasing the air pressure. The yoke can not be removed until the quick acting connection has been severed.

Size, inches	**6**	**8**	**10**
Filter area, sq. inches	28.27	50.26	78.54
Volume, gallons	1.12	2.40	4.18
Length, inches	11	13	15
Width, inches	8	10	13
Height, inches	20	24	28
Weight, shipping, pounds	90	120	165
Each	**$65.00**	**80.00**	**95.00**

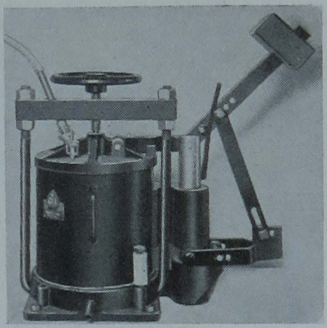
Ore Testing Apparatus, Continued

301M1

301M1 Pulp Sample Filters, Vacuum, Laboratory. For rapid and accurate filtering of pulps. Consists of only two castings, the upper of which is the pulp container, being heavy enough to form an air seal between the filter medium and the base. Two dowel pins which keeps the castings in position eliminate clamps and thumb screws.

The pulp to be dewatered is poured into the container; the vacuum is applied; and the solids are left in a cake on the filter paper. The filter paper and cloth are supported by a wire screen placed over the drain grooves in the base. A tapped opening is provided for the filter connection. The filter cake can be washed if desired.

Size, inches	**12x3**	**12x12**
Area, sq. inches	72	72
Capacity, volume, gallons	0.93	3.74
Length, inches	16	16
Width, inches	14	14
Height, inches	5	14
Weight, shipping, pounds	75	100
Each	**$20.00**	**30.00**

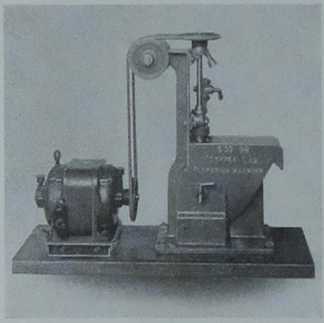


301M2

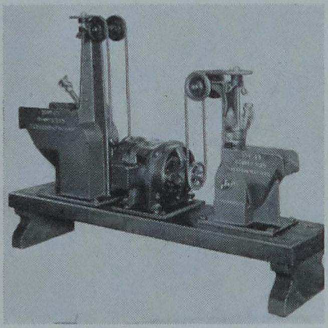
301M2 Pulp Sample Filters, Pressure, Counter Balanced. Designed to handle bucket samples of mill pulps. Owing to the counter-balanced mechanism, it can be operated easily and quickly.

While the filter is being filled the cover is held back by the weight of the counter-balance. During filtering, the yoke holds the filter medium tightly in place, forming a complete seal. Safety is assured by the quick acting pressure coupling which must be disconnected before the filter can be opened. For removal of the filter cake the cylinder is revolved to the side and the filter cake is completely exposed. This unit can be used also as a vacuum filter.

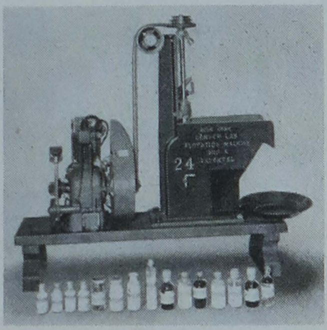
Size, inches	**12**
Filter area, square inches	113.1
Capacity, volume, gallons	5.95
Length, inches	37
Width, inches	18
Height, inches	28
Weight, shipping, pounds	520
Each	**$185.00**



301M3



301M3 Combination



301M6

Flotation Cells, Laboratory, "Sub-A," Fahrenwald. For the treatment and recovery of metallics and non-metallics and the production of high grade concentrates. These machines have demonstrated their reliability and adaptability to all types of flotation problems and are treating many different materials in all parts of the world. They are being used by mining companies, schools, and commercial and government laboratories. The laboratory units are similar in design to large scale commercial machines, and it is possible with these units to duplicate the laboratory results in practical large scale operations.

The interior cell design, with steep sloping sides and rounded corners, eliminates pockets, makes cleaning easy. No blower is necessary, as sufficient air is sucked down the stand-pipe and controlled by a valve conveniently located. A spigot is provided below the froth level for quickly drawing off samples of pulp.

The three sizes are made to handle their rated capacities of dry solids at average dilution. The use of a 2000-gram unit for rougher concentrate makes a practical combination which eliminates excessive dilution in the cleaning operation. Thus, the combination 500-2000 gram machine makes an ideal installation.

For placer flotation work in the field, a 2000-gram machine has been designed to be operated with a ¾ H. P. gasoline engine. The "Sub-A" principle of circulation utilized in laboratory machines makes it possible to treat coarse as well as fine materials. The present extensive practice of saving the mineral at a coarse size makes this feature highly desirable. These units with all iron fittings can be used also for cyanide agitation.

A set of most commonly used reagents, including oils and chemicals with instructions regarding their application, is furnished with each flotation machine.

Capacity, grams	**500**	**1000**	**2000**	**500-2000**
H. P. required	¼	¼	¼	½
Drive	Mule	Mule	Mule	Mule
Weight, motor drive, pounds	190	200	285	420
Weight, belt drive, pounds	165	170	255	....
301M3 Flotation Cells, Motor Driven. Each	**$150.00**	**150.00**	**150.00**	**200.00**
301M4 Flotation Cells, Belt Driven. Each	**$125.00**	**125.00**	**125.00**	......

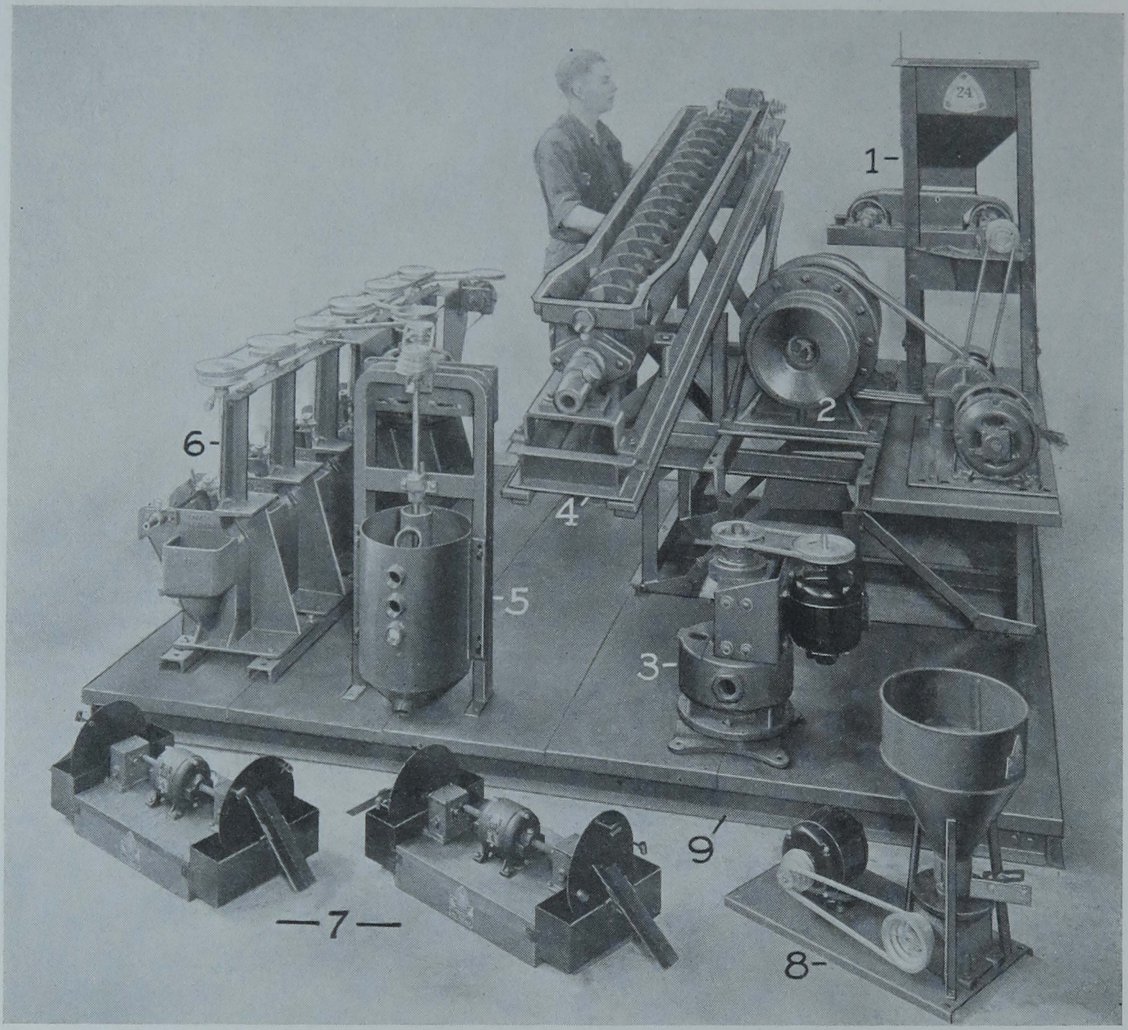
301M5 Flotation Cells, Direct Motor Driven. Capacity, 2000 grams. H. P., ¼. Weight, 230 pounds. **Each**....... **$150.00**

301M6 Flotation Cells, Gasoline Motor Driven. Capacity, 2000 grams. Mule drive; ¾ H. P. gasoline engine. Weight, 330 pounds. **Each**.................... **$150.00**

Note: Any of the above machines equipped with glass sides. Extra, **$15.00.**

Ore Testing Apparatus, Continued

Continuous Laboratory Test Plants



302M1

1—Ore Bin and Feeder.
2—Ball Mill.
3—Sand Pump.
4—Rotary Classifier.
5—Conditioner.
6—Six-Cell "Sub-A" (Fahrenwald) Flotation Machine.
7—Duplex Wet Reagent Feeders.
8—Dry Reagent Feeder (Cone Type).
9—Steel Framework.

Advancements in milling have made it possible to treat the following metallic and non-metallic minerals by flotation or concentration; gold, silver, lead, zinc, copper, iron, mercury, nickel, cobalt, molybdenum, graphite, phosphate rock, fluorspar, talc, mica, barite, feldspar, and coal.

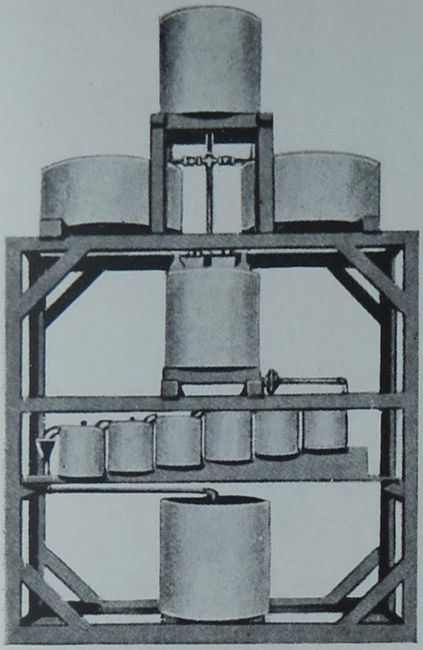
Continuous testing plants are used extensively by universities for research in ore dressing and by mining companies to determine the method of treatment and layout for new projects. These continuous test plants are being used as miniature mills, for experimental work where changes in flowsheet, grinding, and reagents can be tried without the possible loss of time or expense of large scale operations.

The use of the standard Denver "Sub-A" continuous flotation machine in these plants, with its flexibility and quick draining features, has made continuous testing very practical and easy. At Rolla, Missouri, the Bureau of Mines prefers making continuous tests on their Denver "Sub-A" flotation machines to batch work, due to greater accuracy, more information secured, and results obtained being comparable to large plant operations.

302M1 Continuous Laboratory Test Plants. Complete as listed above for handling 100 to 150 pounds per hour. Machines are all-metal, with individual motor V-belt drive. Weight, 4,890 pounds. **Each**.................................. **$2525.00**

302M2 Continuous Laboratory Test Plants. Similar to 302M1, except for handling 200 to 300 pounds per hour. Weight, 10,375 pounds. **Each**.................................. **$3840.00**

Ore Testing Apparatus, Continued



303M1

303M1 Cyanide Plants, Laboratory. For assaying and testing purposes. The frame is built of wood and the tanks of galvanized iron, well painted with cyanide paint, with iron pipe and connections. The tanks are made in special sizes so that they can be nested when shipped. Also, the frame is shipped knocked down. These two features make the complete plant a compact package readily portable.

The small tank shown at the highest elevation is to be used as a solution tank, while the two tanks just below are intended for leaching purposes, and are fitted complete with false bottoms and duck filter cloths. The gold storage tank is directly under the leaching tanks, and below this the zinc precipitation boxes. These boxes are arranged into units so that any number from one to six can be used in making a test.

The piping is so arranged that the solution can be fed to the top or bottom of the leaching tanks.

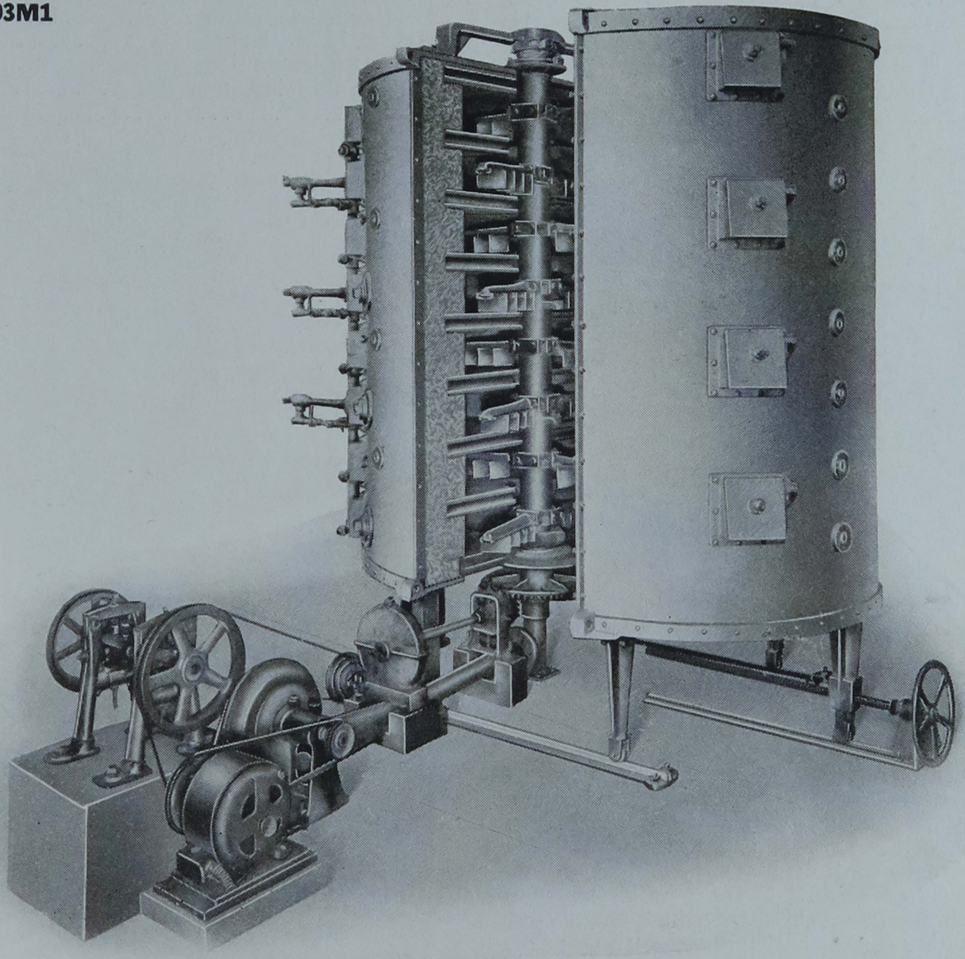
Complete as illustrated including frame work, tanks and fittings.

Capacity, 100 to 200 pounds of ore.

Length, 41 inches; width, 15 inches; height, 64 inches.

Shipping weight, 150 pounds.

Each..**$75.00**



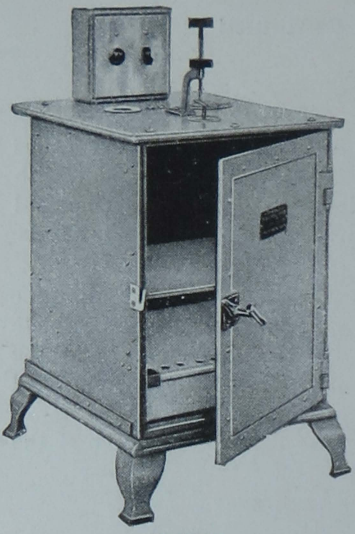
303M2

303M2 Ore Roasting Furnaces, Laboratory, Split Type. Lining, 9 inches thick. Complete with hearth tiles, but without all firebrick lining, power for fan and furnace, foundations, flue connections and flues.

Hearth area, square feet	**37**	**49**	**61**	**85**	**112**
Number of hearths	6	8	10	6	8
Shell diameter, outside, inches	54	54	54	72	72
Height, overall	8′ 7½″	10′ 1½″	11′ 7½″	11′ 4″	13′ 4″
Gas outlet size, diameter inches	6	6	6	13	13
H. P. required	½	½	¾	1	1
Floor space required, approximate feet	6x13	6x13	6x13	12x16	12x16

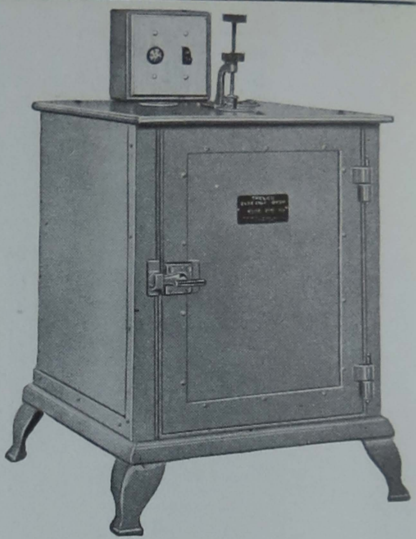
Prices on application

Ovens



304M1

Ovens, Thelco, Electric. The ovens are of two types: single-wall and double-wall. Both are constructed of heavy asbestos, but the double-wall, in addition, has an intervening layer of asbestos air-cell insulating material to increase thermal efficiency. Nickel-chromium heating elements, wound on an asbestos plate below the working chamber, are controlled by a bimetallic thermo-regulator sensitive to plus or minus ½° C. The thermoregulator adjusting knob is on top of the oven for ease in setting, and is equipped with a lock collar. On-and-off toggle switch, with bull's eye pilot light, indicates make and break of heater circuit. Top of oven is provided with a thermometer well and adjustable shutter to control ventilation. Door is framed in cast aluminum. Oven is mounted on a cast iron base with legs 3¼ inches high. Exterior is finished in gray lacquer. Complete with two shelves, adjustable for height on shelf brackets; asbestos heater cord and plug. For operation on 110 or 220 volts, single phase, 25, 40, 50 or 60-cycle A. C. or 110 or 220 volts D. C. Specify current characteristics.



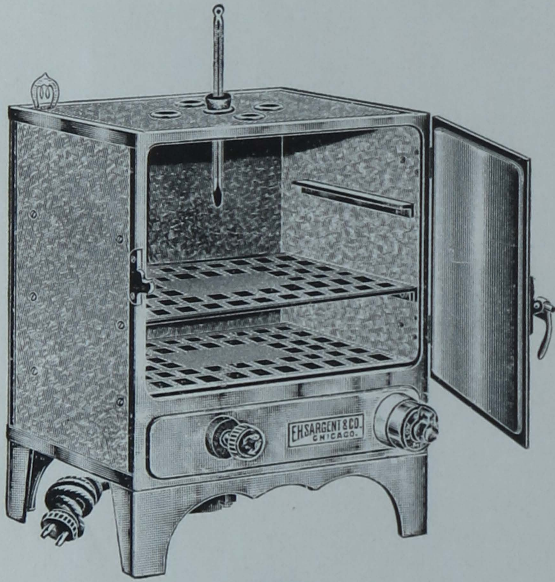
304M2

304M1 Ovens, Thelco, Electric, Single-Wall. For maximum temperature operation of 140° C.

Door	**single**	**double**
Width, inside, inches	10	17½
Depth, inside, inches	10½	11
Height, inside, inches	11	14
Current consumption, watts	700	1500
Weight, shipping, pounds	80	120
Each	**$45.00**	**70.00**

304M2 Ovens, Thelco, Electric, Double-Wall. For maximum temperature operation of 150° C.

Door	**single**	**double**
Width, inside, inches	10	18
Depth, inside, inches	10	9
Height, inside, inches	12	14½
Current consumption, watts	700	1300
Weight, shipping, pounds	100	135
Each	**$75.00**	**115.00**



304M3

304M3 Ovens, Drying, Electric, Sargent. Constructed with walls of transite asbestos mounted in a complete welded Monel metal frame, with insulated double walled Monel metal door, front panel and supporting feet. It is heated by multiple Chromel wire heating units controlled by a three-point switch. The operating range is from slightly above room temperature to 160° C. with a precision of regulation better than plus or minus 1° C. The heating chamber is equipped with two flat, perforated, removable metal shelves. Air inlets at the bottom of the oven are regulated by shutters.

Inside dimensions, inches: height, 10; width, 12; depth, 10. Maximum power consumption, 900 watts.

Complete with two shelves, thermometer having a range from -10 to 200° C. in 1°, pilot light, cord and plug.

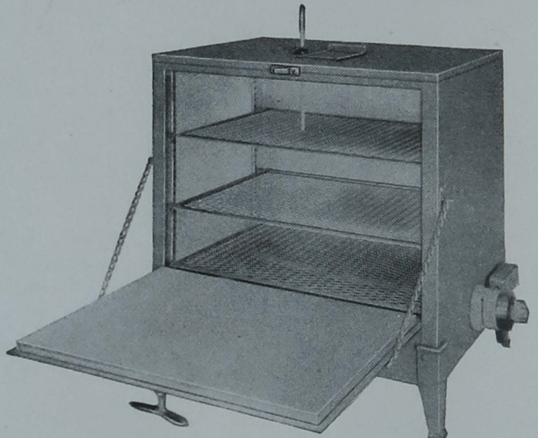
For operation on 110 or 220 volts, A. C. or D. C. When ordering specify current characteristics. **Each** **$35.00**

304M4 Heating Unit, Only. Mounted on transite element with attaching fittings. Specify voltage. **Each** . . . . **$ .75**

304M5 Contact Points, Only. Threaded.
Pair . . . . **$ .75**

304M6 Pilot Lamp, Only, 110-Volt. Each . . . . **$ .85**

304M7 Pilot Lamp, Only, 220-Volt. Each **$1.00**



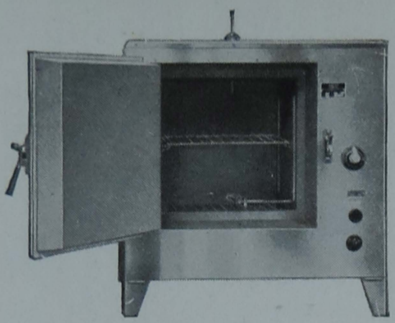
304M8

Ovens, Electric, Despatch. Sterilizers; hot air. For sterilizing, drying and general purpose processing. Temperature range up to 204° C. or 400° F. The double walls are made of heavy gauge sheet iron between which the high grade asbestos insulation is ½ inch thick. The interior finish is aluminum bronze; the exterior, baked French gray wrinkle enamel. Two removable flat screen shelves, adjustable on ½-inch vertical spacings, are provided. The heating elements are mounted in lower portion of the sterilizer and controlled by a three-heat rotary switch or a bi-metallic temperature control. Assembled with attractive table legs. Furnished complete with high grade Centigrade thermometer, cord and plug, and instructions. Sizes 1 and 2 are provided with drop front door; Size 3, with two side swinging doors. For operation on 110 or 220, single phase,60-cycle A. C. or D. C. Specify current characteristics.

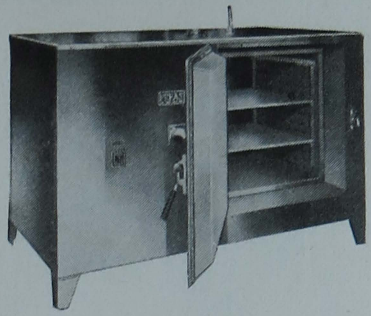
Size	**1**	**2**	**3**
Width, inside, inches	18	24	30
Depth, inside, inches	14	14	18
Height, inside, inches	14	14	24
Current consumption, watts	1250	1500	3300
Weight, shipping, pounds	120	140	275
304M8 Ovens. With 3-heat control switch. **Each**	**$49.50**	**70.00**	**110.00**
304M9 Ovens. With bi-metallic temperature control. Sensitive to ¼° C. **Each**	**$123.00**	**143.00**	**180.00**

304M10 Stands. For 304M8 and 304M9. **Each** **$12.00**

Ovens, Continued



305M1



305M5

Ovens, Gravity Convection, Freas, Electric. For such uses as drying hygroscopic organic and inorganic substances; baking for purposes of control or research; sterilization; curing; aging; etc. Natural air circulation is set up within the working chamber by the force of gravity, the heated air rising to displace the colder air, which descends because of its greater density. Since heat distribution depends upon a vertical airflow, the use of only a single shelf is recommended, although two are provided. Cabinets are double-walled and built on a structural steel framework, electrically welded, with interior braces to withstand warping and buckling. Interior walls, shelves, racks and fastenings are stainless steel, natural finish. Between the double walls is at least a 3-inch thickness of insulating material of low thermal conductivity, fireproof and non-hygroscopic. Doors also are double-walled and insulated; the outer face overlaps chamber. Asbestos gaskets prevent air leakage. Fittings are all-brass, refrigerator type. Low gradient nickel chromium ribbon elements are on high-heat refractory mountings. Sufficient safety factor is allowed to withstand normal variations in line voltage without danger. All joints are welded. The thermo-regulator is the differential linear expansion type. It controls the heating circuit in conjunction with a magnetic relay. Impregnated asbestos-covered wire is flame-proof, moisture proof and heat resisting. One or more adjustable shutter vents (depending upon size of oven) enables control of ventilation and allows for escape of gases and vapors. Complete with two wire stainless steel shelves adjustable in height on shelf rack brackets; mercury in glass thermometer, range 0° to 300° C., with holder; and Neon pilot lamp. Mounted on base 4 inches high. Sizes of 1200 watts or less are provided with 6-foot cord and plug; those drawing in excess of 1200 watts include a suitable terminal block for connecting directly to a power source. Furnished for A. C. or D. C. single phase currents. When ordering, specify current characteristics.

Size	**1**	**2**	**3**	**4**	**5***
Dimensions, inside, inches	13x14x13	13x25x13	19x25x19	19x19x14	37x25x25
Dimensions, outside, inches	25x24x28	25x37x28	31x37x34	31x24x34	49x37x40
Current consumption of oven with range 35° to 150° C., watts	600	1200	1200	800	1800
Current consumption of oven with range 35° to 260° C., watts	1200	2400	2400	1600	3600
Rust-Resistant Iron Exterior, Metallic Aluminum Spray Finish.					
305M1 Ovens. With temperature range, 35° to 150° C. **Each**	**$140.00**	**200.00**	**325.00**	**200.00**	**485.00**
305M2 Ovens. With temperature range, 35° to 260° C. **Each**	**$165.00**	**250.00**	**385.00**	**225.00**	**570.00**
Stainless Steel Exterior, Instrument Satin Finish.					
305M3 Ovens. With temperature range, 35° to 150° C. **Each**	**$185.00**	**260.00**	**425.00**	**260.00**	**600.00**
305M4 Ovens. With temperature range, 35° to 260° C. **Each**	**$210.00**	**310.00**	**485.00**	**285.00**	**685.00**

*Double doors.

Ovens, Mechanical Convection, Freas, Electric. Same in general construction and equipment as the gravity convection oven above. The circulation of heated air, however, is created by a motor driven turbo-blower. Air velocity, pressure and path of circulation, as well as heat content, are controlled to produce a uniform heat distribution and constant temperature throughout the working chamber, regardless of its contents. Mechanical convection accelerates heat transfer; promotes thermal efficiency, increases loading capacity, and insures positive exhaust of gases and vapors. When ordering specify current characteristics.

Size	**1**	**2**	**3***
Dimensions, inside, inches	13x13x13	19x19x19	37x19x25
Dimensions, outside, inches	40x23x29	49x29x36	72x29x42
Current consumption, watts	1200	2400	3600
Rust-Resistant Iron Exterior, Metallic Aluminum Spray Finish.			
305M5 Ovens. With temperature range, 35° to 150° C. **Each**	**$325.00**	**450.00**	**650.00**
305M6 Ovens. With temperature range, 35° to 260° C. **Each**	**$350.00**	**485.00**	**725.00**
Stainless Steel Exterior, Instrument Satin Finish.			
305M7 Ovens. With temperature range, 35° to 150° C. **Each**	**$395.00**	**535.00**	**800.00**
305M8 Ovens. With temperature range, 35° to 260° C. **Each**	**$420.00**	**570.00**	**875.00**

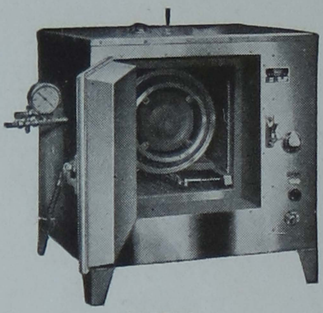
*Double doors.

305M10

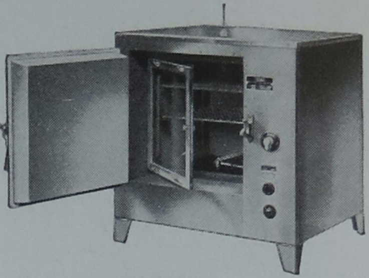
Ovens, Asphalt Drying, Gravity Convection, Freas. A. S. T. M. D-6. Same in general construction as gravity convection oven above. For determining loss-on-heating of asphaltic compounds and oil. Test requires a five-hour heat treatment of the sample at 163° C. within 1° C. while the shelf revolves 5 to 6 R. P. M. Oven will operate within a sensitivity of ½° C. at any point from 35° to 180° C. The speed reduction motor, controlled by an on-off toggle switch, is located on top of the oven and mounted on a sturdy motor bracket. Connected to its speed reduction shaft is a stainless steel extension shaft which protrudes through the insulated wall of the oven into the operating chamber. To this shaft is fastened the revolving shelf, 9¾ inches in diameter. An inner glass door allows full observation of the working compartment without thermal disturbance. Interior walls are stainless steel. Complete with A. S. T. M. mercury glass thermometer, range, 0 to 300° C., with holder; Neon pilot lamp, cord and plug; and full set of directions. Mounted on base legs 4 inches high. Dimensions, inside: 13x14x13 inches. Dimensions, outside: 25x24x34 inches. Current consumption, 800 watts. Furnished for A. C. or D. C. single phase current. When ordering specify current characteristics.

305M9 Ovens. Rust-resistant iron exterior, metallic aluminum spray finish. **Each**	**$235.00**
305M10 Ovens. Polished stainless steel exterior. **Each**	**$280.00**

Ovens, Continued



306M1



306M3

Ovens, Vacuum, Gravity Convection, Freas. Similar in construction to the gravity convection oven shown on page 305. Especially adaptable for heat treating and drying operations under controlled vacuum at constant temperature wherever it is desirable to dehydrate at low temperature under reduced pressures. May be utilized also for ordinary purposes when the cylinder is removed, for which operations an extra stainless steel wire shelf is supplied. The vacuum cylinder consists of a heavy seamless bronze tube fitted to a removable cylinder head which opens the full working area. The cylinder head has a metal-to-metal ground seat which forms a perfect vacuum seal. It is slipped into position and is held, owing to proper fitting, without benefit of gaskets, wedging or clamping devices. Each cylinder is equipped with inlet and outlet connections which extend through the side wall of the oven. Each connection is equipped with a ground metal stopcock and hose connection. The exhaust connection is supplied with a 3-inch diameter dial type vacuum gauge. Complete with two perforated shelves for vacuum cylinder and one stainless steel wire shelf for the oven; mercury in glass thermometer, range 0 to 300° C, with holder; and Neon pilot lamp. Mounted on base legs 4 inches high. Ovens of 1200 watts or less are provided with a 6-foot cord and plug extension; those in excess of 1200 watts include a suitable terminal block for connecting directly to a power source. For single phase A. C. or D. C. When ordering, specify current characteristics.

Size	1	2	3	4
Temperature range, degrees C.	35-150	35-260	35-150	35-260
Cylinder size, inches	9x9x9	9x9x9	9x9x18	9x9x18
Dimensions, inside, inches	13x14x13	13x14x13	13x25x13	13x25x13
Dimensions, outside, inches	25x24x28	25x24x28	25x37x28	25x37x28
Current consumption, watts	800	1200	1200	2400
306M1 Ovens. With rust-resistant iron exterior, metallic aluminum spray finish. **Each**	**$275.00**	**300.00**	**375.00**	**425.00**
306M2 Ovens. With polished stainless steel exterior. **Each**	**$320.00**	**345.00**	**435.00**	**485.00**

Ovens, Humidity, Gravity Convection, Freas. A. S. T. M. C-77. Similar in construction to gravity convection oven shown on page 305. For storage of cement briquettes and other tests where it is desired to operate with relative humidities from 90% to saturation between 70° and 100° F. dry bulb temperatures. Tap water not exceeding 58° F. may be used as a cooling medium when the oven is operating at 70° F. saturation with the maximum room temperature not exceeding 100° F. Auxiliary cooling units can be supplied for unusual conditions. Equipped with a cooling coil located inside the operating compartment; a water inlet which connects to the inside conditioning compartment; immersion type heating units with all terminals sealed moisture tight; a constant water level device; and an inner vapor-tight glass door provided with clamping latches and rubber gasket for sealing the inner working chamber hermetically tight. Interior walls are tinned copper. Furnished complete with pair of stainless steel shelves adjustable for height on shelf rack brackets; mercury in glass thermometer; range 0 to 70° C., with holder; Neon pilot lamp; and 6-inch extension cord and plug. Mounted on base legs 4 inches high. For single phase A. C. or D. C. When ordering, specify current characteristics.

Size	1	2	3	4	5*
Dimensions, inside, inches	13x12x13	13x23x13	19x23x19	19x12x19	37x23x25
Dimensions, outside, inches	25x24x28	25x37x28	31x37x34	31x24x34	49x37x40
Current consumption, watts	400	800	800	400	1200
306M3 Ovens. With rust resistant iron exterior, metallic aluminum spray finish. **Each**	**$200.00**	**295.00**	**450.00**	**295.00**	**625.00**
306M4 Ovens. With polished stainless steel exterior. **Each**	**$245.00**	**355.00**	**550.00**	**355.00**	**740.00**

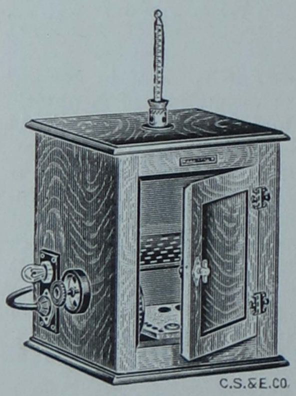
*Double doors.

306M5 Ovens, Paraffin Embedding. For temperature of 56° C. with range of adjustment 50° to 60° C. Ovens are insulated. Made of well-seasoned, five-ply wood and finished in attractive hand-rubbed oak finish. Temperature is controlled by expanding capsule-type thermo-regulator with a visible temperature setting, which can be adjusted from outside. Equipped with heating plates on which are mounted a number of standard electric heating units for uniform distribution of heat within the operating space. Complete with pilot lamp, Centigrade thermometer, and removable shelves. Furnished without stand. Size 3 is supported on wooden legs 3 inches high. When ordering specify current characteristics.

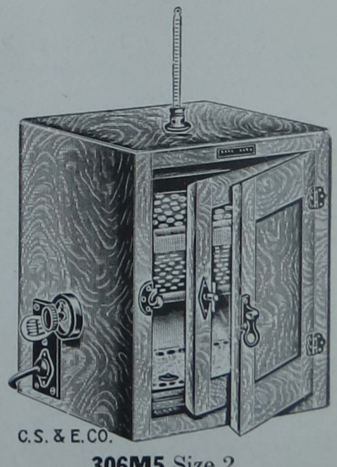
Size	1	2	3	4	5
Width, inside, inches	9	12	14½	18	20
Depth, inside, inches	9	10½	12½	18	18
Height, inside, inches	12	15	16½	26	30
Shelves, number	1	2	2	2	2
Doors, number	1	2*	1	2*	2*
Each	**$46.25**	**73.50**	**76.50**	**112.50**	**132.50**

*Inner door fitted with clear glass.

306M6 Floor Stands, Only. 32 inches high. With shelf. **Each** **$20.00** **20.00**

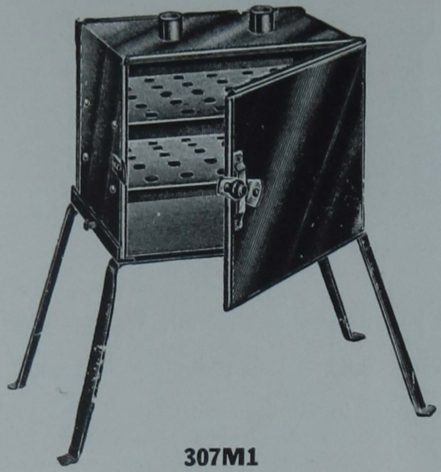


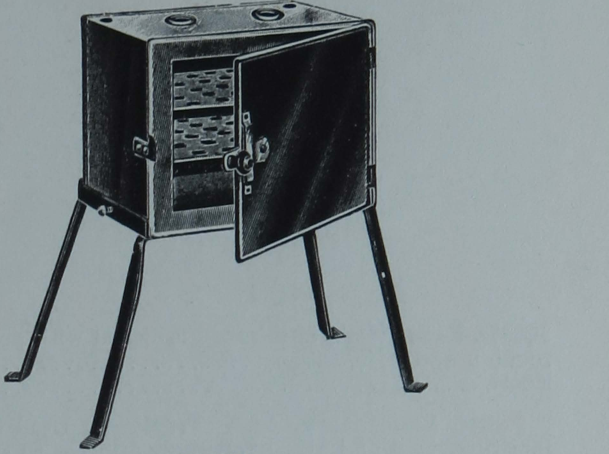
306M5 Size 1



306M5 Size 2

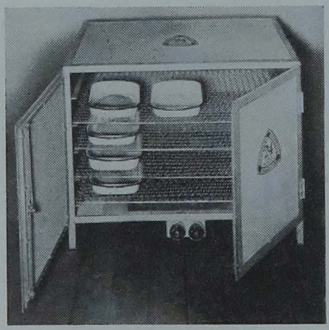
Ovens, Continued


307M1


307M2

Ovens, Drying, Gas. Ovens are of two types: single-wall and double-wall. For such applications as moisture determinations and baking of dehydrated samples. Made of copper with two perforated shelves, hinged door and latch, and mounted on a sturdy iron support 9 inches high. A sheet iron plate shields the oven bottom from the burner flame. Each oven is provided with a thermometer well and air vent. Double-wall ovens are provided with a tubulature for filling and to which a reflux condenser may be attached to hold concentration of the heating medium. Single-wall ovens will reach a higher temperature than the double-wall, but the latter distribute heat more evenly and maintain a more uniform temperature.

Size	**1**	**2**	**3**
Width, outside, inches	10	12	16
Depth, outside, inches	8	10	12
Height, outside, inches	8	10	12
307M1 Ovens, Drying, Single-Wall. Each	**$12.00**	**17.00**	**27.00**
307M2 Ovens, Drying, Double-Wall. Each	**$18.50**	**24.00**	**39.00**


307M3

307M3 Ovens, Sample Drying, Electric. For drying concentrates or other pulps in the laboratory. Consists of a cabinet containing five heavy wire mesh shelves which allow the air to circulate freely. A substantial and accurately wound resistance element is located in the base and amply shielded against spillage. Proper ventilation allows immediate discharge of moisture-laden air.

The cabinet is of heavy asbestos board, covered with aluminum paint.

Temperature rise: Room temperature to 300° F. in 20 minutes.

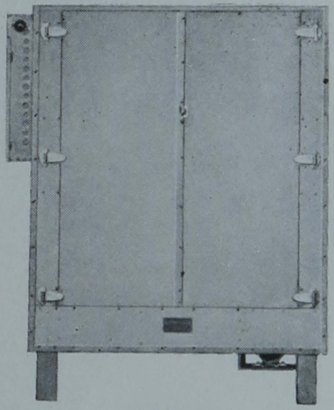
Capacity, 12 cubic feet. Current consumption, 1.5 to 3 Kw.

Dimensions: length, 36 inches; width, 24 inches; height, 24 inches.

Shipping weight, 175 pounds.

For 110 volts A. C. **Each**.......................**$130.00**

307M4 Ovens, Sample Drying. For 220 volts A. C. Otherwise, same as 307M3. **Each**.......................**$130.00**


307M5

307M5 Ovens, Sample Drying, Massco. Designed for the quick and efficient electrical drying of ore samples by preheated air which is mechanically forced over each sample pan before exhausting into the atmosphere. The shelves are of solid material to eliminate the danger of salting samples below them. The air flows at a rate well below the point at which there is a possibility of particles dislodging from one pan and being deposited in another, thereby avoiding salting in this manner. The samples are not permitted to reach the boiling point of water. Cabinet is constructed of sheet metal with double walls, containing ample rock wool insulation. The electric heaters are protected by a thermostat to avoid accidental overheating. Has 9 shelves with a total capacity of eighteen 18x18x2¾-inch sample pans, and dries samples of 70% moisture content in from 3 to 5 hours.

For operation on 110 and 220 volts A. C. and D. C. When ordering, specify current characteristics. **Each**......**$375.00**

307M6 Thermostatic Cut-Off Device. For 307M5. For cutting off the oven immediately upon completion of the drying cycle. **Each**.................................**$40.00**

Note: Available in sizes to meet almost any requirements and any electrical specifications. Further information will be furnished upon request.

308M1

PROTECT YOUR PLANT AND EQU
125
RED
QUIGLEY
AAA
TRIPLE-A
PROTECTIVE COATING
TRIPLE-A

308M2

308M1 Pails, Hard Rubber. Furnished with pouring lip and handle of steel heavily rubber covered. Designed for service and rough usage.

Size, gallons	1	2	3	4	5
Each	**$8.50**	**9.50**	**10.50**	**12.00**	**15.00**

Paint, Laboratory, AAA (Triple-A). Used to protect metal and wood coming in contact with alkali and acid fumes. Is moisture, acid and alkali resisting. Adheres to surfaces and also penetrates surface pores. Dries quickly. This paint contains no leads, vegetable or animal oils, grease or turpentine.

308M2 Paint, Black, AAA. A highly protective rust-preventing coating for all interior and exterior applications where the qualities of protection and durability are essential. Not recommended around foodstuffs due to strong odor while drying. One-gallon can **$2.10**

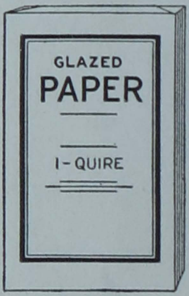
308M3 Paint, Black, AAA. For interior use and suitable for general protective purposes where foodstuffs are handled. One-gallon can **$2.10**

308M4 Paint, Aluminum, AAA. For protecting and decorating. Has a black base. One-gallon can **$3.35**

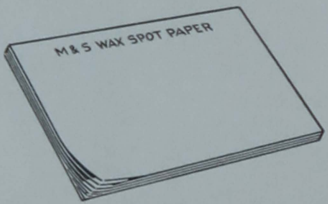
308M5 Paint, Acid Proof. For laboratory desks, table tops and shelving. Imparts a permanent black finish to wood and is easy to apply. One quart each of solutions A and B with directions **$1.00**

Paint, Laboratory, Plicote. Water-proof and easy to apply. The vehicle is composed principally of a rubber hydrocarbon derived from pure crepe rubber, and has many of the properties of a rubber coating. Gives a rich gloss finish, which resists alkali, acids, and moisture. Plicote can be applied by spraying, brushing, or dipping. One gallon will cover approximately 720 square feet when applied to surfaces previously primed. Dries quickly and leaves no brush marks. Will stand temperatures up to 350° F. Supplied in ten colors: Red, Dust, Green, White, Black, Brown, Cream, Aluminum, Light Gray, Battleship Gray.

Size	Pint	Quart	Gallon
308M6 Paint, Laboratory, Plicote, All Colors except White	**$ .85**	**1.60**	**6.00**
308M7 Paint, Laboratory, Plicote, White	**$ .95**	**1.75**	**6.50**



308M8



308M12

Paper, Glazed. Used for collecting, transferring and weighing ash and precipitates. Size, 10x12 inches.

308M8 Paper, Glazed, White. Hundred sheets . . . . **$ .75**

308M9 Paper, Glazed, Black. Hundred sheets . . . . **$ .75**

308M10 Paper, Glazed, Blue. Hundred sheets . . . . **$ .75**

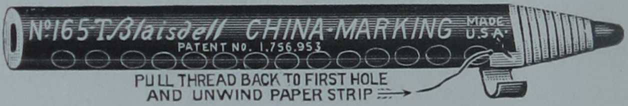
308M11 Paper, Glazed, Yellow. Hundred sheets . . . . . **$ .75**

308M12 Paper, Waxed, Spot. Spot Pads. Put up in pads of 100 sheets, 4x6 inches. **Pad** . . . . **$ .25**

308M13 Papers, Whatman Drop Reaction No. 120. Preferred to porcelain plates for many purposes as the paper gives a more visible reaction. Size of sheets, 14x22 cm.
Quire **$1.30**
Hundred sheets **$4.25**

308M14 Paper, Bibulous. High quality absorbent paper for drying slides or fine glassware. Book of 50 sheets, 4x6 inches. **Each** . . . . **$ .10**

Note: Lens Paper shown on page 232.


No.165-T Blaisdell CHINA-MARKING
MADE U.S.A.
PATENT NO. 1,756,953
PULL THREAD BACK TO FIRST HOLE AND UNWIND PAPER STRIP

308M15

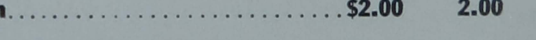
308M15 Pencils, Wax. For writing on glass, porcelain and similar highly polished surfaces. With wax enclosed in hard rolled paper.

Color	Red	Black	Blue	White
Each	**$ .15**	**.15**	**.15**	**.15**
Dozen	**$1.50**	**1.50**	**1.50**	**1.50**

308M16 Pencils, Wax, Laboratory, Heat Resisting. For writing on glass, porcelain and polished surfaces. Markings withstand temperatures up to 300° C. and colors are stable in the presence of all ordinary reagents. Wax enclosed in hard rolled paper.

Color	Red	Black	Blue
Each	**$ .20**	**.20**	**.20**
Dozen	**$2.00**	**2.00**	**2.00**

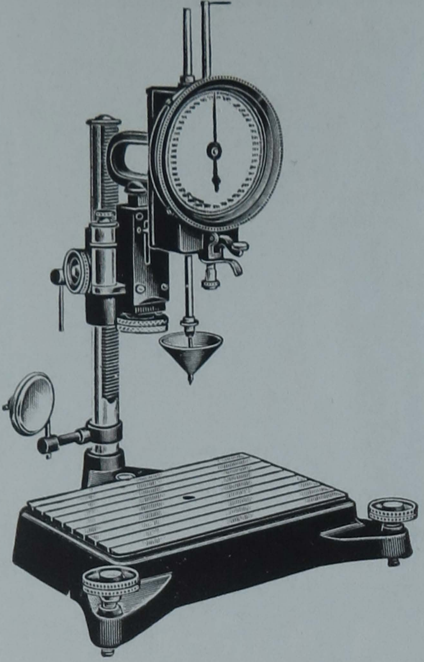
308M17 Pencils, Marking Crayons. Red, heat resisting. Used instead of Reddle sticks for marking assay crucibles. Diameter, ½ inch; length, 5 inches. **Each** . . . . **$ .10**
Dozen **$1.00**



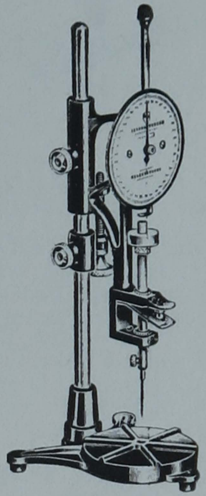
308M18

308M18 Pencils, Diamond. For writing on glass.
Each **$2.00**

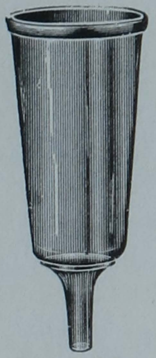
Penetrometers



309M1



309M3



309M8

309M1 Penetrometers, Universal, A. S. T. M. D-5 and D-217-T. Universal in application, can be used for penetration tests of bituminous materials, petrolatum and greases. For these tests either a standard A. S. T. M. asphalt penetration needle, a Roberts No. 2 needle, or standard A. S. T. M. grease penetration cone is used. Penetrometer measures the depression in the sample caused by a given force applied over a given area, and the average of such tests expressed in millimeters penetration is considered an index to "penetrability." The glass covered dial, 4 inches in diameter, is graduated to 38 mm. in 1/10 mm. divisions. On a total drop of the plunger, dial pointer makes more than one complete revolution, allowing direct penetration readings to 40 mm. Setting mechanism has micrometer adjustment screw. A safety release clutch prevents accidental release and "after-slip" of the plunger which is independent of the dial mechanism. To determine the depth of penetration after the plunger has been brought to rest, the lever above the mechanism head is lowered gently as far as it will go. By this action, the needle is swept around the dial and the depth of penetration read directly. Loading weights, 50 and 100 grams, are included on a rack attached to the instrument. A hollow cork-bottom recess in the weight holder accommodates the penetration needle. The rectangular base presents a smooth, unobstructed operating surface sufficiently large to accommodate a standard railroad grease bar or the usual sample can. A rubber bumper in the base directly below the penetrating plunger safeguards the needle or grease cone. A mirror facilitates preliminary setting by reflecting light across the surface of the sample, and intensifying the image of the needle point. Proper setting is secured by contacting the actual needle point with its image. The instrument is light enough for comfortable carrying, and is equipped with grip handle. Furnished complete with one each 50 and 100-gram weights, 2 standard A. S. T. M. needles and mirror. Without grease cone. **Each**.......... **$125.00**

309M2 Penetrometer Storage and Carrying Case. For 309M1. All metal; dust proof; black Crystalline baked-on finish. Dimensions: 15 inches high; 13½ inches wide; 13¼ inches deep. **Each**.......... **$10.00**

For grease cone and grease worker, see page 294.

309M3 Penetrometers, Junior Model, Portable. A. S. T. M. D-5. Adaptable to a wide variety of applications involving penetration measurements, including bituminous materials, asphalt, tar pitch, heavy lubricants, and cement. Stainless steel, corrosion-resisting, knife-edged bearings control the movement of the test rod. Setting mechanism has micrometer adjustment for lowering penetrating instrument into exact contact with the surface of the sample. Penetration measurements can be made directly to a depth of 38 mm. on a single sweep of the A. S. T. M. D-5 needle around the dial, or to a maximum depth of 39 mm., by adding the reading of the needle after it has passed the zero mark. Since the test rod weighs 47.5 grams and the standard needle is 2.5 grams, penetration tests can be conducted with total loads of either 50 or 100 grams. The clutch releases the bar instantaneously and arrests its motion precisely without any after-slip. Functioning parts of the instrument are nickel-plated brass. The heavy iron base, with rubber bumper insert and face-machined platform fins, is heavily coated with baked-on black japan to resist the usual corrosive agencies. For clear legibility, the etched metal dial, 4 inches in diameter, has black figures against a dull satin-finish background. Furnished complete with one A. S. T. M. standard needle and a 50-gram weight. **Each**.......... **$50.00**

309M4 Penetrometer Metal Carrying Case. For 309M3. **Each**.......... **$7.50**

309M5 Penetrometer Needles. A. S. T. M. D-5. Blunt point. As specified for penetration of bituminous materials. **Each**.......... **$1.50**

309M6 Penetrometer Needles. Same as 309M5, except certified for accuracy by U. S. Bureau of Standards. **Each**..... **$2.75**

309M7 Penetrometer Needles, Roberts No. 2. Sharp point and longer taper than 309M5. **Each**.......... **$ .65**

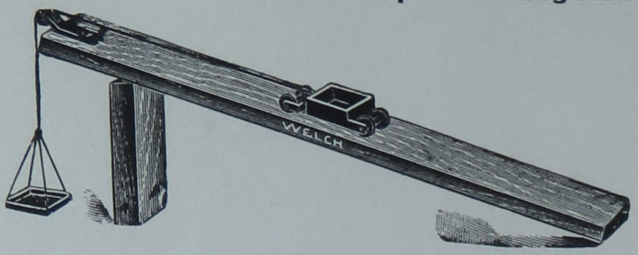
Percolators

309M8 Percolators. Glass. Cone shaped.

Capacity, pints	1	2	4	8
Each	**$ .80**	**.90**	**1.50**	**2.00**

Physics Apparatus

Write for separate catalog showing complete line of physics apparatus.



310M1

310M1 Planes, Inclined. Hardwood board, with pulley. Without carriage, scale pan or support block. **Each**...$1.75

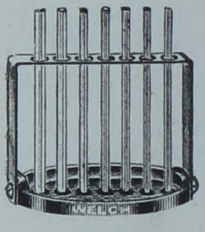
310M2 Hall's Carriages. Improved design. Made entirely of metal with hook for attaching cord. Wheels are mounted on hardened steel cone bearings, with locknuts; forward pair, on swivel. **Each**................................$1.00

Pulleys, Bakelite. Wheels are made of molded Bakelite. Pulleys are 5 cm. in diameter, mounted in a frame made of hard aluminum with S hooks of steel wire. Complete with two movable hooks.

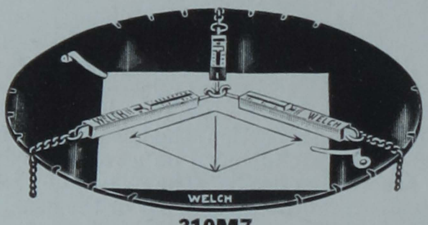
310M3 Pulleys, Single. Each.....................$ .30

310M4 Pulleys, Double. Each....................$ .40

310M5 Pulleys, Triple. Each.....................$ .60



310M6



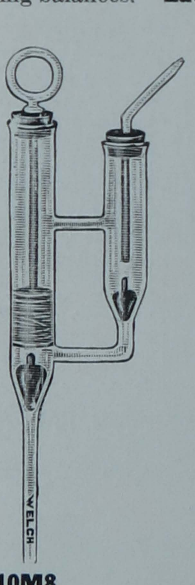
310M7

310M6 Capillary Tubes. Set of 7 tubes and metal support. **Complete**......................................$ .90

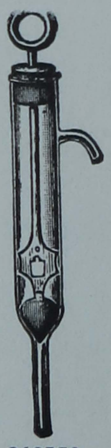
310M7 Composition of Force Board. Consists of a metal disc 40 cm. in diameter slotted every 10 degrees in which the chain may be inserted. Finished in black japan. Two clips are provided for holding a paper so lines may be traced. Complete with three 25-pound spring balances. **Each**..$3.00

310M8 Force Pumps. Glass. Shows valve action. **Each**...................$1.50

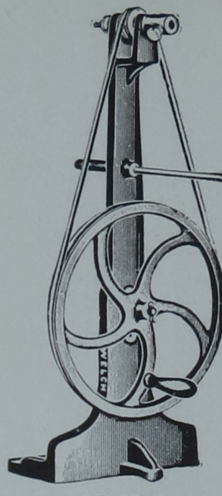
310M9 Lift Pumps. Glass. Shows valve action. **Each**...................$1.50



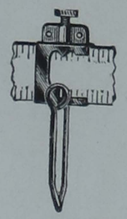
310M8



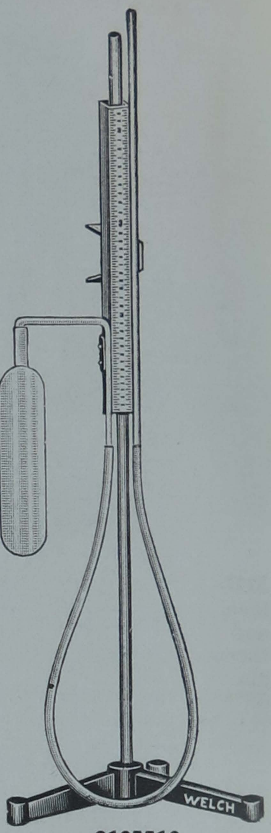
310M9



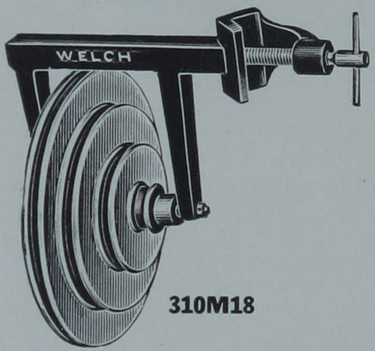
310M10



310M13



310M16



310M18

310M10 Table Rotators, Hand. The shaft or chuck is fastened to a bearing bracket supported on a sturdy hexagon rod and tripod. The wheel drive is 10 inches in diameter, making a ratio of 8 to 1 at the chuck. Can be used horizontally or vertically. **Each**..........................$8.75

310M11 Centrifugal Hoops. To fit 310M10. Consists of 2 metal rings, 20 cm. in diameter. **Each**...............$1.25

310M12 Glass Globes. For rotating liquids of different densities. Diameter of glass globe, 15 cm. Has a metal axis cemented to lower side of globe with shaft to fit any standard rotator chuck. **Each**............................$3.50

310M13 Lever Knife-Edge Clamps. For clamping a meter stick for lever experiments. **Each**..................$ .25

310M14 Pascal Vases, Improved Form. Pressure of water on the heavy oil-silk diaphragm at any position of the reservoir is instantly recorded by a pointer on the dial at the bottom of vessel. Apparatus is accurate to less than 1 mm. of rise or fall in any vessel. Complete with three vases. **Each**...$22.00

310M15 Pendulum Illustration. Consists of an iron tripod and a 125-cm. long rod supporting a pendulum clamp. Complete with 2 one-inch iron balls and one wood ball and suspension cords. **Each**...............................$3.75

310M16 Air Thermometers. Consists of a straight glass tube and a regular air thermometer bulb of 175 ml. capacity connected by a rubber tube mounted firmly on the side of a scale 40 cm. long. Latter is held by a spring clamp which slides on a 100-cm. rod screwed into a heavy tripod. Complete without mercury. With instructions.............$4.00

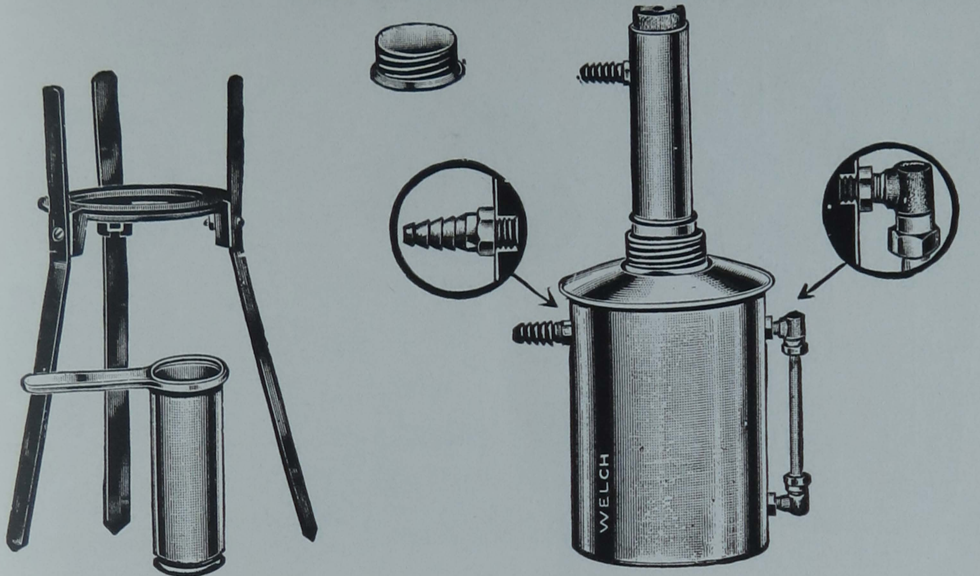
310M17 Hemispheres, Magdeburg. Consists of two hollow hemispheres of iron, 9 cm. in diameter, with flanged edges ground to an air-tight fit. Provided with handles and stopcock. Mounted on base. **Each**....................$5.50

310M18 Wheel and Axle. Bakelite. With 4 diameters. Mounted on cone bearings in an iron frame. Grooves are accurately designed to be in the ratios of 1, 3, 5 and 7. With clamp for any rod up to 19 mm. **Each**..............$2.25

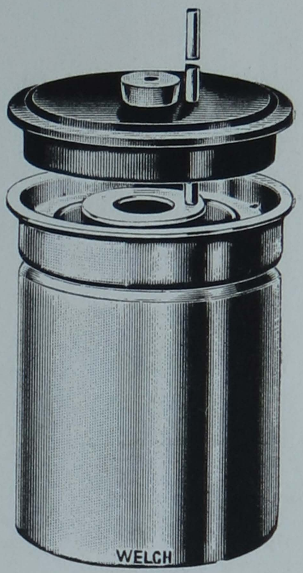
Write for separate catalog showing complete line of physics apparatus.

Physics Apparatus, Continued

Write for separate catalog showing complete line of physics apparatus.



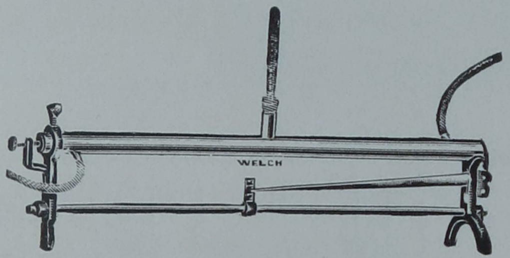
311M1



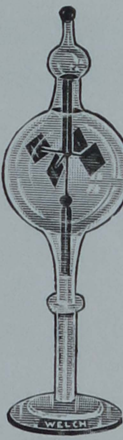
311M2

311M1 Steam Generators (Hypsometer). Boiler is one-piece, heavy copper with cover spun on. Capacity, 1 liter. Water-level gauge is of commercial boiler-gauge type, with a glass tube 3/8 inch in diameter permanently mounted with rubber gaskets and with a reinforcing rod between the two brass fittings attached to the side of the boiler. An extension tube for holding the thermometer; a one-hole cork stopper; a dipper for specific heat experiments; a screw-cap for the boiler and tripod are furnished also. With instructions. **Each**........ **$3.75**

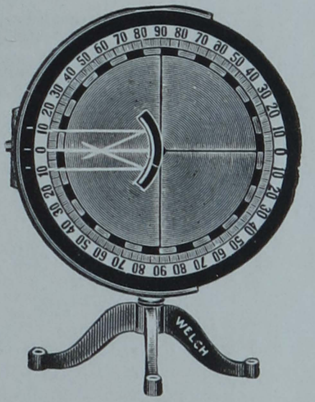
311M2 Calorimeters. Double-wall. Consists of two heavy drawn and polished aluminum vessels which fit together with a fiber ring between for support. Outer vessel is 14x11 cm., and the inner vessel has a capacity of 250 ml. Complete with Bakelite cover and metal stirrer. **Each**........ **$2.75**



311M3



311M4



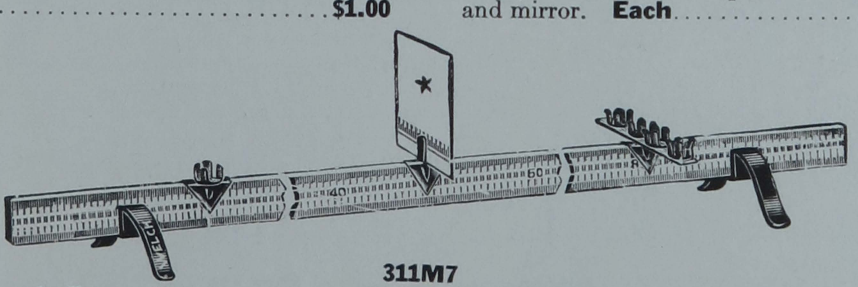
311M6

311M3 Linear Expansion Apparatus. Nickel-plated brass tube, mounted on metal supports. Has a millimeter scale and a long lever, indicating the expansion of metals. Complete with steel rod, 60 cm. long. **Each**........ **$4.75**

311M4 Radiometers. Single bulb. One set of vanes. **Each**........ **$2.40**

311M5 Ball and Ring. For demonstrating expansion of metal. The ball when heated will not pass through the ring. **Each**........ **$1.00**

311M6 Optical Discs. Consists of a graduated scale mounted on a revolving disc 12 inches in diameter, supported on a tripod stand. The screen revolves independently of the disc. Complete with set of lenses, colored glass and mirror. **Each**........ **$21.00**



311M7

311M7 Photometers, Simple Form. For elementary work. Consists of Bristol board screen with star aperture in center; meter stick, graduated in inches and millimeters; metal supports; one-candle holder; four-candle holder; and screen support. **Each**........ **$1.25**

311M8 Demonstration Lenses. Set of six crown glass lenses, 1½ inches in diameter, with ground edges; double convex, double concave, plano-convex, concave-convex, convex and concave. **Each**........ **$2.50**

311M9 Prisms, Equilateral. Flint glass. 1x1½ inches long. **Each**........ **$ .65**

311M10 Mirrors, Plane. Glass. 4x15 cm. **Each**..... **$ .10**

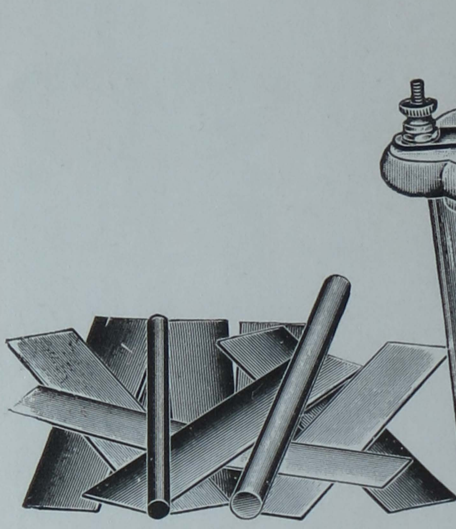
311M11 Mirrors, Concave and Convex. Double-faced glass, 10 cm. in diameter, with frame and handle. **Each**..... **$2.85**

311M12 Mirrors, Cylindrical. Concave and convex. Brass nickel-plated. **Each**........ **$ .60**

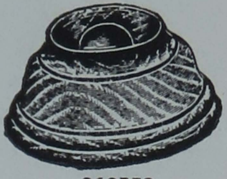
Write for separate catalog showing complete line of physics apparatus.

Physics Apparatus

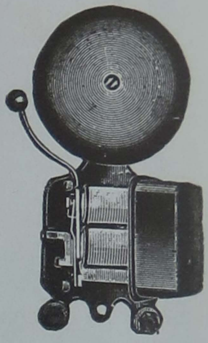
Write for separate catalog showing complete line of physics apparatus.



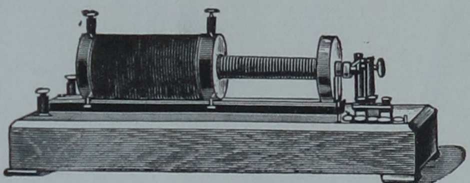
312M1



312M3



312M4



312M6

312M1 Batteries, Students' Demonstration. Consists of a glazed porcelain top with two clamps for holding round or flat elements and with two binding posts for the wire connections. Complete with porous cup, zinc pencil, carbon pencil, and assorted elements. **Each**....................$1.25

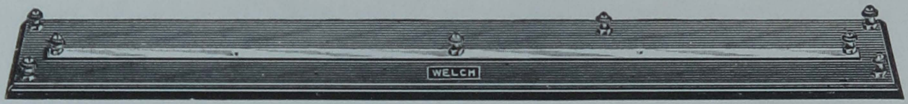
312M2 Batteries, Electric, Dry Cell, No. 6. 1½ volts, 35 amperes. **Each**..................................$ .40

312M3 Push Buttons. Each......................$ .15

312M4 Bells, Electric, Iron Box. 2½-in. gong. **Each**..$ .50

312M5 Bells, Electric. With adjustable vibrator contacts. Otherwise, same as 312M4. **Each**...................$1.00

312M6 Induction Coils. Demonstration form. With sliding secondary coil and condenser and mechanical switch mounted on polished mahogany box. ¼-inch spark. **Each**.....$8.50



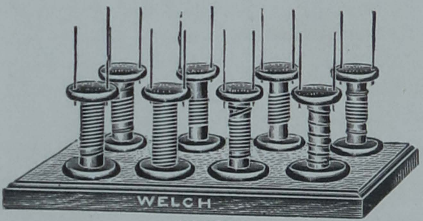
312M7

312M7 Wheatstone Bridges. According to Millikan and Gale. Mahogany finished board over one meter long. **Each**...$3.60

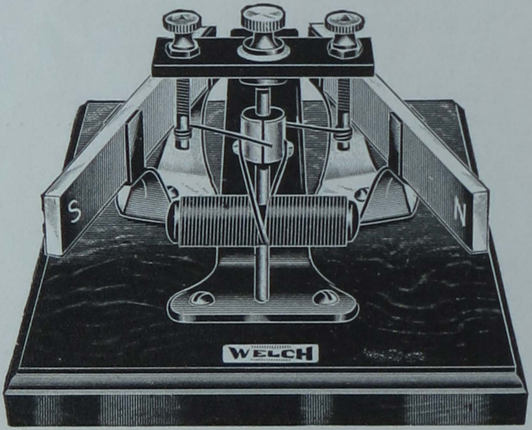
312M8 Resistance Spool Sets. Consists of 8 spools mounted on a natural finished wood base as follows:

2 spools, 200 cm., No. 30, German silver
1 spool, 200 cm., No. 28, German silver
1 spool, 120 cm., No. 30, German silver
1 spool, 160 cm., No. 30, German silver
1 spool, 80 cm., No. 30, German silver
1 spool, 40 cm., No. 30, German silver
1 spool, 2000 cm., No. 30, copper wire

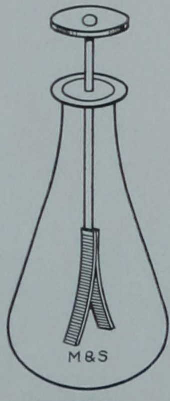
Complete Set...$5.00



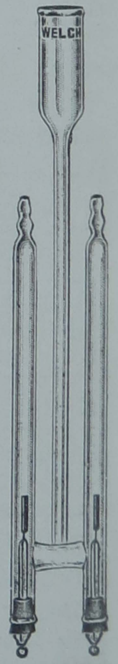
312M8



312M9



312M10



312M11

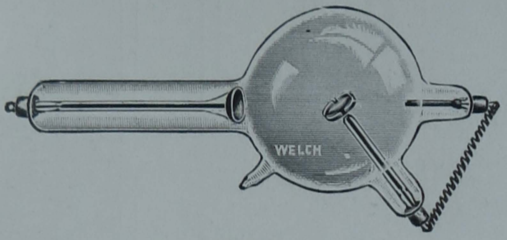
312M9 St. Louis Motors. Laboratory model. For demonstrating all phases of motor and dynamo construction and operation. Strongly constructed and mounted on a metal base. Complete, with two 15-cm. bar magnets, and combined A. C. and D. C. armature, without electro-magnet attachment. **Each**..............................$3.50

312M10 Electroscopes, Flask Form. Complete with aluminum leaves, rubber stopper, rod, and 300-ml. flask. **Each**..$ .80

312M11 Electrolysis of Water, Improved Form. With two removable platinum electrodes which may be replaced by either copper or carbon electrodes. Glass part is 40 cm. high. **Each**..$3.00

Physics Apparatus, Continued

Write for separate catalog showing complete line of physics apparatus.



313M1

313M1 X-Ray Tubes. Will operate on a static machine or induction coil producing a spark from 1 to 3 inches. Has a bulb 7 cm. in diameter with 3 electrodes. **Each**.....**$13.50**

313M2 Crooke's Tubes. A maltese cross placed in the path of the cathode stream casts a shadow in the fluorescene on the wall of the tube. Will also demonstrate the deflection of the cathode rays by a magnet. Consists of a pear-shaped vacuum bulb. Mounted horizontally on wood base. **Each**..**$8.00**

313M3 Geissler Tubes. Set of 6 assorted, 6 inches long. **Set**..**$5.75**

313M4 Static Machines, Toepler-Holtz. Consists of a 12-inch revolving and a 14-inch stationary plate supported by two cast iron uprights. The revolving plate is driven by a 4½-inch pulley with a ¼-inch round leather belt. The leyden jars of electric glass are sealed in a brass jacket firmly bolted to the base. A nickel-plated brass cap sealed to the neck of the leyden jar supports a rod to which the combs and discharge arms are fastened. The above parts are mounted on a mahogany finished base. All metal parts are nickel-plated or baked enameled finish. **Each**....................**$29.50**

313M5 Friction Rods. Solid glass. One end polished; the other ground. **Each**............................**$ .55**

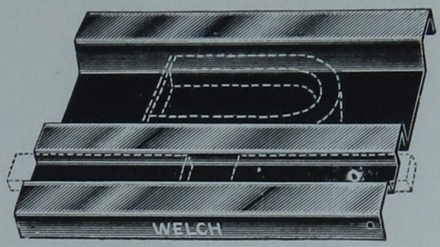
313M6 Friction Rods. Sealing wax. **Each**..........**$ .18**

313M7 Friction Rods. Vulcanite. ⅜ by 10 inches. **Each**..**$ .30**

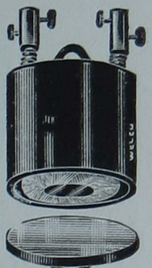
313M8 Catskins. Half-hide. For exciting a static charge. **Each**..**$ .75**

313M9 Pith Balls. Colored. Large size. **Dozen**.....**$ .50**

313M10 Electrophorous. For generating electricity by induction. Consists of a hard rubber plate, 15 cm. square, mounted on a metal base. Complete with aluminum disc and rubber handle. **Each**..........................**$1.20**



313M11



313M14

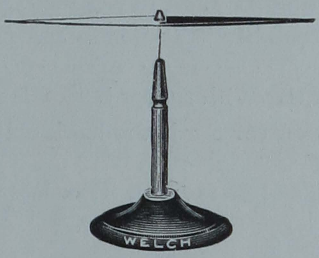
313M11 Magnet Boards. For use in plotting magnetic lines of force. Hardwood; with grooves, without magnet. **Each**..**$1.05**

313M12 Lodestones. Natural magnet. **Each**........**$ .20**

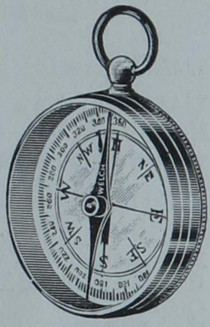
313M13 U Magnets. Length, 14 cm. Poles 1.9 by 1.3 cm. Distance between poles, 5 cm. **Each**................**$ .50**

313M14 Lifting Magnets, Electric. Will lift up to 25 pounds on 6 volts of current. **Each**..................**$3.25**
For other magnets, see page 235.

313M15 Helices. Simple form. One coil insulated wire on wood base. Diameter, 2.5 cm.; length, 15 cm. **Each**..**$1.50**



313M16



313M18

313M16 Magnetic Needles. Length, 15 cm. Mounted on stand. **Each**..**$ .70**

313M17 Dipping Needles. A metal casting supporting a protractor and a pivoted magnetic needle. Mounted on a brass base. **Each**..**$2.70**

313M18 Compasses. Brass case, with ring handle.

Size, mm.	25	40	50
Each	**$ .25**	**.40**	**.55**

Polarized Light Equipment

Single Marks Polarizing Plate. Polarization of light is a phenomenon utilized today in many scientific and technical fields. Marks single polarizing plates consist of a glass plate, on one surface of which is a polarizing film in optical contact with the glass. The plates are approximately 46% transparent to ordinary light and have a wide angle of polarization with polarization equally effective at all angles of incidence. These plates are also color-neutral by transmission. Temperatures up to 75° C. (167° F.) are not harmful to them. and they will withstand all ordinary weather conditions. Especially suitable where high transmission of light together with a strong polarization is required as in non-glare work, in sextants, binoculars, photographic filters, the retinoscope and opthalmoscope, etc.

Size, inches	¼	⅜	½	¾	1
313M19 Edged Circle, Scientific Grade. Each	**$1.25**	**2.00**	**3.15**	**5.75**	**7.75**
313M20 Unedged Square, Scientific Grade. Each	**$1.25**	**2.00**	**3.15**	**5.75**	**7.75**

313M21 Edged Circle, Commercial Grade.

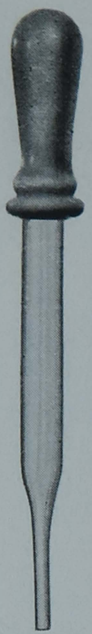
Size, inches	¾	1	1¼	1½	2
Each	**$2.00**	**2.50**	**3.00**	**4.00**	**5.00**

313M22 Marks Polarizing Biplates, Scientific Grade. Consists of two Marks polarizing plates with their polarizing films placed together, and planes of polarization coinciding, and a transparent medium placed between these films. A 120° cone of light may be passed through the plate and polarization is equally effective at all angles of incidence. Used in polariscopes, photo-elastic apparatus, Kerr cells, on optical benches for classroom demonstrations of the principles of polarized light.

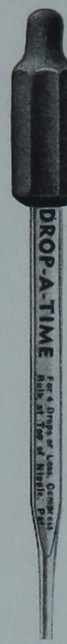
Size, inches	¼	⅜	½	¾	1
Each	**$2.00**	**3.50**	**5.50**	**8.00**	**10.75**

Write for separate catalog showing complete line of physics apparatus.

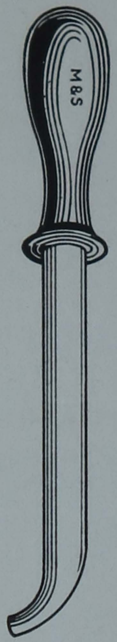
Pipettes



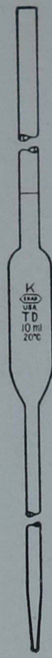
314M1



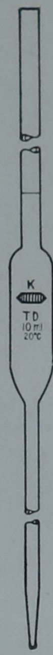
314M2



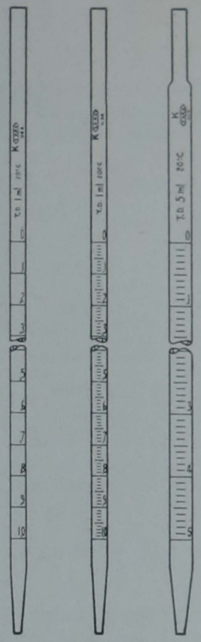
314M3



314M5



314M6



314M8

314M1 Pipettes, Dropping, Straight. With rubber bulb. Glass part 3 inches long. One dozen in folding box. **Dozen**. . $ .20

314M2 Pipettes, Dropping, Straight. With non-rolling rubber bulb. Glass part 3½ inches long. One dozen in folding box. **Dozen**. . . . . $ .25

314M3 Pipettes, Dropping, Bent. With rubber bulb. Glass part 3 inches long. One dozen in folding box. **Dozen**. . . . . . $ .25

314M4 Pipettes, Dropping, Bakelite. For hydrofluoric acid and similar liquids. With rubber bulb; straight tip. **Each**. . $2.50
Note: For rubber bulbs, see page 336.

314M5 Pipettes, Volumetric, Exax Blue Line. Transfer. With long delivery stem.

Capacity, ml.	**1**	**2**	**3**	**4**	**5**	**10**	**15**	**20**	**25**	**50**	**100**	**200**
Quantity in case	48	48	48	48	72	72	36	36	72	36	12	6
Each	**$ .35**	**.35**	**.35**	**.35**	**.35**	**.40**	**.50**	**.50**	**.50**	**.65**	**1.00**	**2.00**
Dozen	**$ 3.78**	**3.78**	**3.78**	**3.78**	**3.78**	**4.32**	**5.40**	**5.40**	**5.40**	**7.02**	....	....
Case	**$13.44**	**13.44**	**13.44**	**13.44**	**20.16**	**23.04**	**14.40**	**14.40**	**28.80**	**18.72**	**9.60**	**9.60**

314M6 Pipettes, Volumetric, Transfer. With long delivery stem.

Capacity, ml.	**1**	**2**	**5**	**10**	**25**	**50**	**100**
Quantity in case	48	48	72	72	48	48	36
Each	**$ .20**	**.20**	**.22**	**.25**	**.30**	**.45**	**.65**
Case	**$8.64**	**8.64**	**14.26**	**16.20**	**12.96**	**19.44**	**21.06**

314M7 Pipettes, Volumetric, Normax, Precision. With long delivery stem. Accurate within the tolerances specified by the National Bureau of Standards in Circular 9, "Testing of Glass Volumetric Apparatus."

Capacity, ml.	**1**	**2**	**5**	**10**	**20**	**25**	**50**	**100**	**200**
Tolerance, ml.	±0.006	.006	.01	.02	.03	.03	.05	.08	.10
Quantity in case	12	12	12	24	12	24	12	6	3
Each	**$ .50**	**.65**	**.70**	**.80**	**1.00**	**1.00**	**1.10**	**1.30**	**3.00**
Case	**$4.80**	**6.24**	**6.72**	**15.36**	**9.60**	**19.20**	**10.56**	**6.24**	**7.20**

314M8 Pipettes, Measuring, Exax Blue Line, Mohr Type.

Capacity, ml.	**1/10**	**2/10**	**1**	**1**	**2**	**5**	**10**	**25**
Graduations, ml.	1/100	1/100	1/10	1/100	1/10	1/10	1/10	1/10
Quantity in case	36	36	36	36	36	36	48	24
Each	**$ .40**	**.40**	**.35**	**.45**	**.45**	**.45**	**.50**	**.75**
Case	**$11.52**	**11.52**	**10.08**	**12.96**	**12.96**	**12.96**	**19.20**	**14.40**

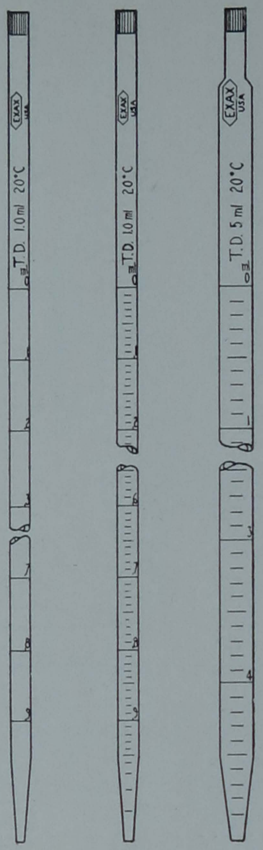
314M9 Pipettes, Measuring, Mohr Type.

Capacity, ml.	**1**	**1**	**2**	**5**	**10**	**25**
Graduations, ml.	1/10	1/100	1/10	1/10	1/10	1/10
Quantity in case	72	72	72	72	72	24
Each	**$ .25**	**.30**	**.30**	**.30**	**.35**	**.60**
Case	**$16.20**	**19.44**	**19.44**	**19.44**	**22.68**	**12.96**

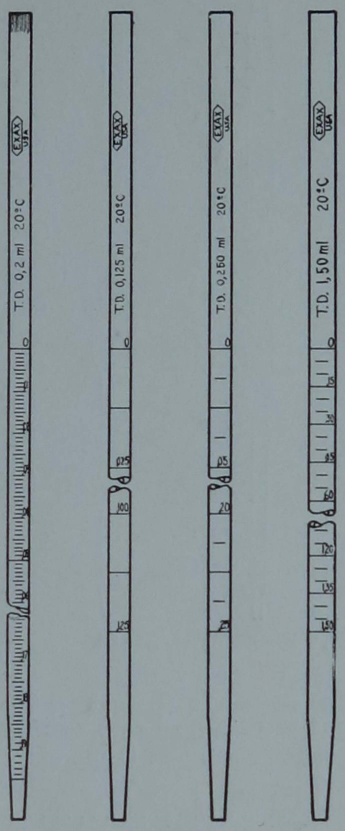
314M10 Pipettes, Measuring Normax. Mohr Type. Accurate within tolerances specified by the National Bureau of Standards in Circular No. 9, "Testing of Glass Volumetric Apparatus."

Capacity, ml.	**1**	**1**	**2**	**5**	**10**	**25**
Graduations	1/100	1/10	1/10	1/10	1/10	1/10
Tolerances, ml.	± .01	.01	.01	.02	.03	.05
Quantity in case	12	12	12	12	12	12
Each	**$1.00**	**.65**	**.75**	**.75**	**1.00**	**1.80**
Case	**$9.60**	**6.24**	**7.20**	**7.20**	**9.60**	**17.28**

Pipettes, Continued



315M1



315M3

315M4

315M1 Pipettes, Serological, Exax Blue Line. Calibrated to point.

Capacity, ml.	**1/10**	**2/10**	**1**	**1**	**2**	**5**	**10**
Graduations, ml.	1/100	1/100	1/10	1/100	1/10	1/10	1/10
Quantity in case	72	72	72	72	72	72	72
Each	**$ .40**	**.40**	**.35**	**.45**	**.45**	**.45**	**.50**
Dozen	**$4.32**	**4.32**	**3.78**	**4.86**	**4.86**	**4.86**	**5.40**

315M2 Pipettes, Serological. Calibrated to point.

Capacity, ml.	**1**	**1**	**2**	**5**	**10**
Graduated, ml.	1/10	1/100	1/10	1/10	1/10
Quantity in case	144	144	144	144	144
Each	**$ .25**	**.30**	**.30**	**.30**	**.35**

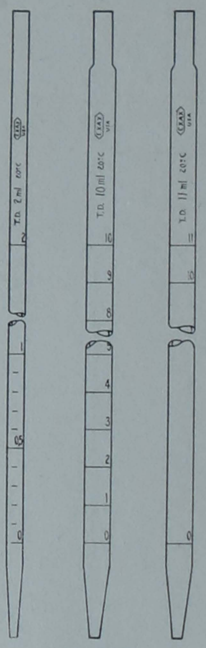
315M3 Pipettes, Serological, Exax Blue Line, Kahn. The 0.2 ml. is the original pipette designed for the Kahn precipitation test and has been retained for general use. The other pipettes have a 2½-inch base, so that the graduations will be clearly visible when the tip of the pipette is delivering liquid into a test tube. With this listing of Kahn pipettes a separate pipette is provided for each volume of antigen used in the test. In this way a longer scale length is allowed for each necessary volume, permitting greater accuracy. The 0.125 ml. pipette delivers 10 charges of 0.0125 ml.; the 0.250 ml. sizes give 10 charges of 0.025 ml. or 20 charges of 0.0125 ml. and the 0.05 ml. quantities can be taken from the 1.5 ml. pipette. The 1.5 ml. pipette also provides for 10 charges of 0.15 ml. of serum without refilling.

Capacity, ml.	**0.2**	**0.125**	**0.250**	**1.5**
Graduations, ml.	0.001	0.0125	0.0125	0.05
Quantity in case	72	72	72	72
Each	**$ .70**	**.60**	**.60**	**.65**
Dozen	**$7.56**	**6.48**	**6.48**	**7.02**

315M4 Pipettes, Volumetric, Exax Blue Line, Bacteriological. Without bulb. The 1.1 ml. is graduated at 1 ml. and 1.1 ml.; the 2.2 ml. at 1.0, 2.0, 2.1 and 2.2 ml.; the 11 ml. at every 1 ml. The 1, 5 and 10 ml. sizes have one line only. The 1, 1.1, 2.2, and 11 ml. sizes are recommended by the American Public Health Association for making milk dilutions.

Capacity, ml.	**1.0**	**1.1**	**2.2**	**5**	**10**	**11**
Quantity in case	72	72	72	72	72	72
Each	**$ .25**	**.30**	**.30**	**.30**	**.35**	**.50**
Dozen	**$2.70**	**3.24**	**3.24**	**3.24**	**3.78**	**5.40**

Pipettes, Continued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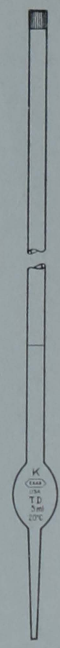
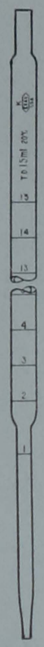

316M3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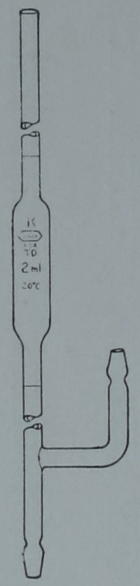
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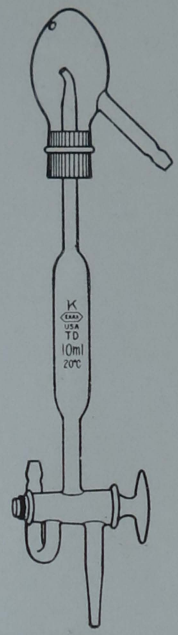
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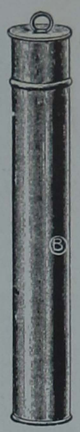
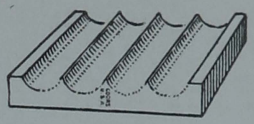

316M9


316M10

316M1 Pipettes, Water Analysis, Exax Blue Line. Patterned after the specifications of the Hygienic Laboratory, U. S. Public Health Service. The 2 ml. pipette is graduated from 0 to 1 ml. in 1/10 ml. and also at 2 ml.; the 10 ml. pipette is graduated in 1 ml. throughout; the 11 ml. pipette is graduated at 10 and 11 ml. only. There is a clear space above the graduations of at least 100 mm.

Capacity, ml.	**2**	**10**	**11**
Quantity in case	72	72	72
Each	**$ .40**	**.50**	**.50**
Dozen	**$4.32**	**5.40**	**5.40**

316M2 Pipettes, Assay Ton. Graduated at 29.166 ml. **Each** **$1.00**

316M3 Pipettes, Ostwald-Folin. Exax Blue Line. Heavy glass. Graduated to deliver to the tip.

Capacity, ml.	½	1	2	3	5	10
Each	**$ .50**	**.50**	**.50**	**.60**	**.60**	**.75**
Dozen	**$ 5.40**	**5.40**	**5.40**	**6.48**	**6.48**	**8.10**
Case of 36	**$14.40**	**14.40**	**14.40**	**17.28**	**17.28**	**21.60**

316M4 Pipettes, Folin-Wu, Exax Blue Line. Graduated from tip in 1 ml. for use in the preparation of protein free blood filtrates.

Capacity, ml.	5	10	15
Each	**$ .50**	**.60**	**.60**
Dozen	**$ 5.40**	**6.48**	**6.48**
Case of 72	**$28.80**	**34.56**	**34.56**

316M5 Pipettes, Calibrating, Exax Blue Line, Ostwald.

Capacity, ml.	2	5
Each	**$ .75**	**1.00**
Case of 12	**$7.20**	**9.60**

316M6 Pipettes, Automatic Measuring, Exax Blue Line. With three-way stopcock.

Capacity, ml.	10	25	50
Each	**$ 3.50**	**3.80**	**4.00**
Case of 12	**$33.60**	**36.48**	**38.40**

316M7 Pipettes, Automatic Measuring. Similar to 316M6. With white line graduations.

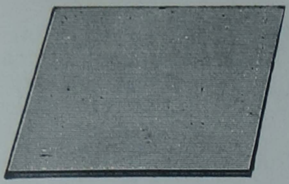
Capacity, ml.	100	177
Each	**$6.50**	**6.50**

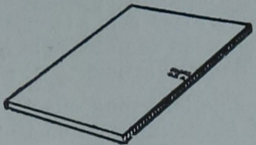
316M8 Pipette Boxes. Made of copper; round shape. Deep, telescoping covers allow the pipettes to be removed freely. Constructed of heavy sheet, with locked seams and reinforcing beads which serve as stops for the tight dust-proof covers. 2½x13½ inches. **Each** **$2.00**

316M9 Pipette Boxes. Same as 316M8, except 2½x16 inches. **Each** **$2.00**

316M10 Pipette Rests, Coors Porcelain. Glazed with exception of bottom. Width, 70 mm.; length, 90 mm. **Each** **$1.10**

Plates


317M1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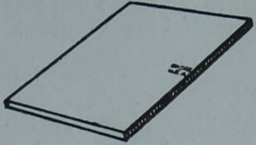
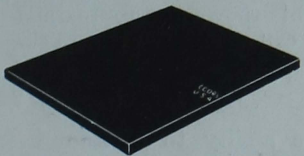

317M6


317M7

317M1 Plates, Glass, Square. For use as vessel covers. Medium weight clear glass with smooth cut edges not ground.

Size, inches	2x2	3x3	4x4	5x5	6x6	8x8	10x10
Each	**$ .05**	**.05**	**.05**	**.09**	**.13**	**.20**	**.30**

317M2 Plates, Glass, Square, Ground. Clear medium weight glass with one side ground (frosted); with smooth cut edges not ground.

Size, inches	3x3	4x4	5x5	6x6	8x8	10x10
Each	**$ .05**	**.06**	**.09**	**.13**	**.20**	**.30**

317M3 Plates, Plate Glass, Square, Ground. For use with bell jars or for grinding or color mixing. Made of heavy weight plate glass with one surface ground (frosted) and smooth cut edges not ground.

Size, inches	6x6	8x8	10x10	12x12	15x15	20x20
Each	**$ .40**	**.50**	**.65**	**1.00**	**1.50**	**3.00**

317M4 Plates, Glass, Blue, Cobalt, Square. For flame observation. With smooth cut edges not ground.

Size, inches	2x2	3x3	4x4	5x5	6x6
Each	**$ .10**	**.12**	**.15**	**.20**	**.30**

Note: We can supply glass plates cut to specifications. Prices on application.

317M5 Plates, Streak, Coors Porcelain, Unglazed. For arsenic test and for mineralogical work.

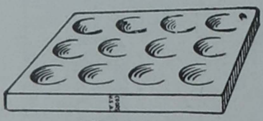
Size	**1**	**2**	**3**	**4**	**5**	**6**
Length, mm.	65	70	85	90	100	140
Width, mm.	50	40	60	60	60	90
Thickness, mm.	3	3	4	4	4	4
Each	**$ .22**	**.22**	**.35**	**.40**	**.45**	**.55**

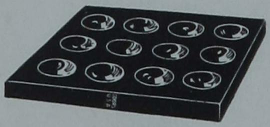
317M6 Plates, Coors Porcelain. Flat surface. Glazed with exception of bottom surface.

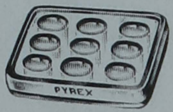
Size	**1**	**1A**	**1B**	**2**	**3**	**4**	**5**	**6**	**7**
Length, mm.	102	127	140	152	140	127	203	203	254
Width, mm.	102	127	140	152	178	203	203	305	254
Thickness, mm.	7	7	7	7	7	7	7	7	7
Each	**$ .70**	**1.10**	**1.45**	**1.50**	**1.65**	**2.30**	**2.80**	**3.70**	**4.15**

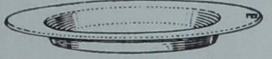
317M7 Plates, Coors Porcelain, Black Glaze. Same as 317M6, except flat surface is glazed black with exception of bottom surface which is unglazed.

Size	1	1A	1B	2	3	4	5	6	7
Each	**$1.40**	**2.20**	**2.90**	**3.00**	**3.30**	**4.60**	**5.60**	**7.40**	**8.30**


317M8


317M9


317M10


317M11

317M8 Plates, Spot, Coors Porcelain. Glazed with exception of bottom surface.

Size	**0000***	**000**	**00**	**0**	**1**	**2**	**3**	**4**
Length, mm.	92	109	112	120	118	160	180	180
Width, mm.	31	89	92	92	91	125	110	140
Thickness, mm.	12	12	7	12	13	13	13	13
Number of depressions	3	12	12	6	12	12	24	30
Diameter of depressions, mm.	21	22	21	29	21	30	21	21
Depth of depressions, mm	7	8	5	8	7.5	7.5	7.5	7.5
Each	**$ .40**	**.77**	**.77**	**.77**	**.77**	**1.05**	**1.50**	**1.65**

317M9 Plates, Spot, Coors Porcelain, Black Glaze. Same as 317M8, except is black glazed, with unglazed bottom surface.

Size	0000*	000	00	0	1	2	3	4
Each	**$ .80**	**1.54**	**1.54**	**1.54**	**1.54**	**2.10**	**3.00**	**3.30**

317M10 Plates, Spot, Glass, Pyrex. For use in soil chemistry. With nine concave depressions, 22 mm. outside diameter by 7 mm. deep. Length, 100 mm.; width, 85 mm. **Each, $ .75. Case** of 18 .... **$12.15**

317M11 Plates, Porous, Coors Porcelain. For drying precipitates and crystals. Dinner plate shape.

Size	**00***	**1**	**1A**	**2**
Diameter, top, mm.	85	159	220	250
Diameter, bottom, mm.	47	105	140	167
Height, mm.	20	24	32	30
Each	**$ .06**	**.20**	**.28**	**.45**

*Suitable for micro-analysis.

Platinum Ware

Prices. On account of the fluctuation of the market, we are unable to print prices, but quotations are based upon the lowest market price and are subject to immediate acceptance. Weights shown are approximate. Special items made of platinum can be supplied, and prices will be quoted upon request.

Uses of Platinum

The ability to withstand acids and high temperatures makes platinum the most desirable material for carrying on many chemical reactions and for general analysis. It is used in great quantities as a catalyzer, particularly in the production of fixed nitrogen from the air and in the sulphuric acid contact process; but in many other processes it has the property of promoting chemical reactions between substances without undergoing any change itself.

Care of Platinum Ware

It is important to remember that, although platinum is not oxidized in the air at any temperature, nor attacked by any single acid, yet there are many substances that attack and combine with it at comparatively low temperatures.

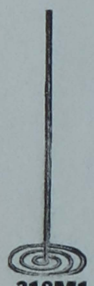
The caustic alkalies, the alkaline earths, nitrates and cyanides and especially the hydroxides of barium and lithium attack platinum at a red heat, although the alkaline carbonates have no effect at the highest temperatures.

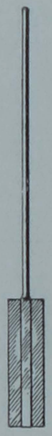
Phosphorous and arsenic attack platinum when heated with it; therefore phosphates, arsenates, etc., should not be ignited in their filter paper in the crucible.

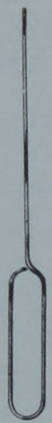
Silicon, which may be formed by the reducing action of carbon on silica, causes brittleness.

Contact with compounds of easily reducible metals like lead is dangerous at high temperatures, because low-fusing platinum alloys are readily formed.

Do not put platinum in the inner cone of the Bunsen flame; the carbon in this cone reacts with the platinum to form a carbide which causes brittleness and general deterioration.


318M1


318M2


318M3

318M1 Platinum Anodes, Spiral. Made of round platinum wire .055 inches in diameter. Wound in a flat spiral. Total height, 5 inches; diameter,1 inch.1 Weight, approximate, 10 grams.

318M2 Platinum Anodes, Paddle Form. 4½ inches long. Paddle blade, 1⅜ by ⅜ inches. Stem No. 16 platinum iridium wire welded to paddle blade. Weight, approximate, 4 grams.

318M3 Platinum Anodes, Loop Form. Made of platinum wire .05 inches in diameter in the form of a narrow loop with the stem centered. Total height, 5 inches. Loop, 2 by ½ inches. Weight, approximate, 5 grams.

Cleaning Platinum Ware

Every careful analyst of necessity uses clean utensils. The habit of cleaning and polishing platinum ware immediately after using is easily formed, and repays the user with increased confidence in his work as well as with the prolonged life of the article.

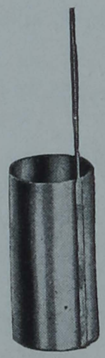
The loosening effect of the Bunsen flame upon the surface of platinum exposed to its action produces the familiar gray appearance which can not be removed except by burnishing. Rubbing the surface of platinum with moist sea sand (round grains only), applied with the finger, serves to remove most impurities and to polish the metal, without material loss in weight.

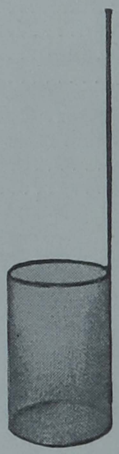
Fusing bisulphate of potash or borax in the vessel and then boiling in water and polishing as above with sand is recommended by Gmelin. When it is desired to clean the outer surface of vessels in this manner, they must be placed in dishes of sufficient size to allow the fused flux to envelope completely the article to be cleaned.

Sodium amalgam possesses the property of wetting platinum without amalgamating with it, even when other metals are purposely added to the amalgam. This substance is, therefore, useful for effecting a quick and thorough cleansing of platinum. The amalgam is gently rubbed upon the metal with a cloth and then moistened with water, which oxidizes the sodium and leaves the mercury free to alloy with foreign metals. The mercury is then wiped off and the article cleaned and polished with sand, as above described.

If the existence of a base metal alloyed with the platinum is suspected, immerse the article in question first in boiling hydrochloric acid for a few minutes; then, after thoroughly rinsing with clean water, in boiling nitric acid free from chlorine. If the article is unaffected in weight or appearance, and the acid baths fail to give reaction for base metals, the absence of such is assured.

318M4


318M5


318M6

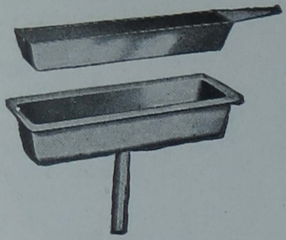
318M4 Platinum Anodes, Gauze. Made in the form of a cylinder of 52-mesh wire gauze with stem centered. .05 inches in diameter. Gauze edges are reinforced and stem is connected by radial members at top and bottom. Total height, 4½ inches. Height of cylinder, 2 inches; diameter of cylinder, ½ inch. Weight, approximate, 8 grams.

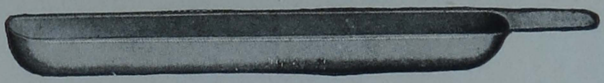
318M5 Platinum Cathodes. Cylindrically shaped. Made of sheet platinum in the form of a closed cylinder with a platinum wire stem .05 inches in diameter. Total height, 4 inches; height of cylinder, 2 inches; diameter, 1 inch. Weight, approximate, 11 grams.

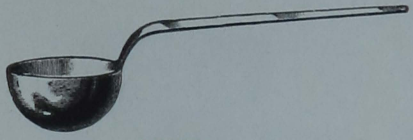
318M6 Platinum Cathodes, Gauze, Cylindrical Form. Made of 52 mesh wire gauze with stem .05 inches in diameter with reinforced edges at top and bottom. Total height, 6 inches. Height of cylinder, 2 inches; diameter of cylinder, 1 inch. Weight, approximate, 8 grams.

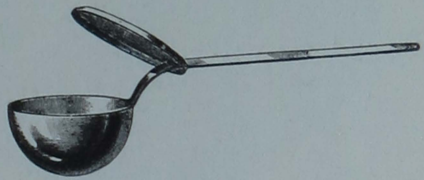
Prices on platinum ware quoted on request.

Platinum Ware, Continued


319M1


319M2


319M3


319M4

319M1 Platinum Combustion Boats and Holders, Blair's Form. For iron and steel analysis. Weight, approximate, 19 grams. Other sizes and patterns made to order upon request.

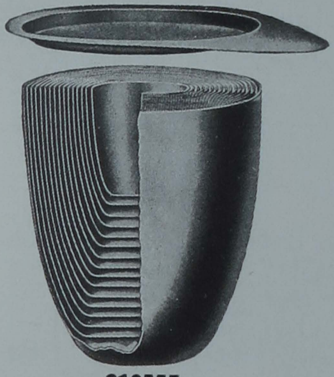
319M2 Platinum Combustion Boats. ½-inch wide by ⅜-inch deep.

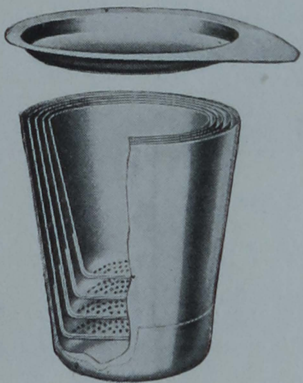
Length, inches	**1½**	**2**	**3**	**3¾**
Weight, approximate, grams	3	4	6	6.5

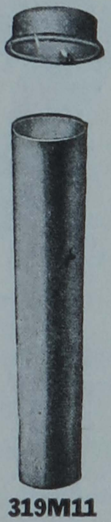
319M3 Platinum Combustion Spoons. Without covers.

Diameter, inches	¼	⅜	½	⅝	¾
Depth, inches	5/32	7/32	9/32	11/32	13/32
Weight, approximate, grams	.9	2	4.2	4.6	6.5

319M4 Platinum Combustion Spoons. Same as 319M3, except with covers.


319M5


319M9


319M11

319M5 Platinum Crucibles, Regular Form. With covers.

Capacity, ml.	**10**	**15**	**20**	**25**	**30**	**40**	**50**
Diameter and depth, cm.	2.5	3	3.3	3.5	4	4.2	4.4
Weight, approximate, grams	12	17	23	28	34	44	55

319M6 Platinum Crucibles, Regular Form. Without covers. Otherwise same as 319M5.

Capacity, ml.	**10**	**15**	**20**	**25**	**30**	**40**	**50**
Weight, approximate, grams	8.5	12.3	16.2	20.3	24.2	32.2	41.5

319M7 Platinum Crucibles, Students'. With thin wall, 20 ml. capacity. Weight, approximate, with cover, 10 to 11 grams.

319M8 Platinum Crucibles, Students'. Same as 319M7, except without cover. Weight approximate, 7 to 8 grams.

319M9 Platinum Crucibles, Gooch Form. With covers and caps.

Capacity, ml.	**10**	**15**	**20**	**25**	**30**
Diameter and depth, cm.	2.7	3.2	3.3	3.6	3.9
Weight, approximate, grams	13	18	22	29	34

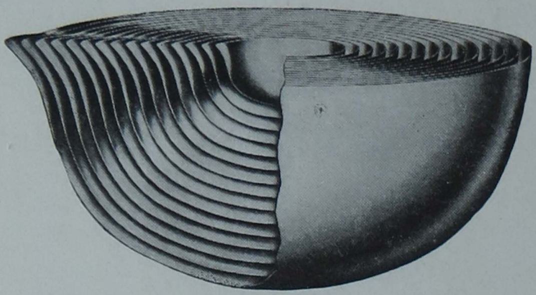
319M10 Platinum Crucibles. With flanged capsule covers. For determination of volatile matter in coal and coke.

Capacity, ml.	**10**	**15**	**20**	**25**	**30**
Diameter and depth, cm.	2.5	3	3.3	3.5	4
Weight, approximate, grams	12	17	23	28	34

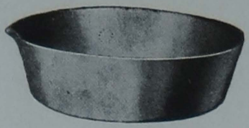
319M11 Platinum Crucibles, J. Lawrence Smith Form. Used in alkali determinations. Height, 8 cm.; diameter of top, 1.8 cm.; capacity, 18 ml. Weight, approximate, 34 grams.

Prices on platinum ware will be quoted upon request.

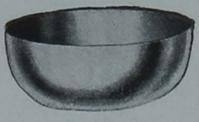
Platinum Ware, Continued



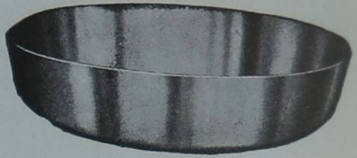
320M1



320M2



320M3



320M4

320M1 Platinum Dishes, Evaporating. With lip.

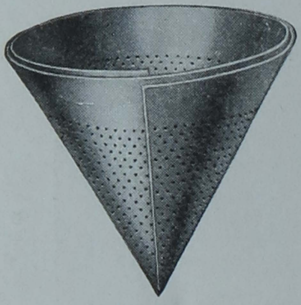
Capacity, ml.	**15**	**20**	**25**	**50**	**75**	**100**	**150**	**200**	**250**	**300**
Diameter, cm.	3.8	4.2	4.4	5.6	6.5	7.2	8.4	9.4	9.8	10.4
Depth, cm.	1	2	2.2	2.7	3.3	3.5	3.7	4.3	4.5	4.8
Weight, approximate, grams	5	6	8	17	25	33	50	67	80	94

320M2 Platinum Dishes, Sugar Analysis. Capacity, 35 ml.; approximate weight, 16 grams.

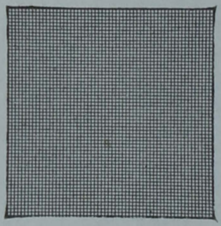
320M3 Platinum Dishes. For sugar analysis.

Capacity, ml.	18	25
Weight, approximate, grams	10	12

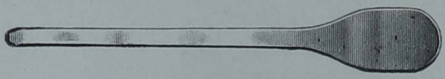
320M4 Platinum Dishes. For water analysis. Capacity, 100 ml.; approximate weight, 20 grams.



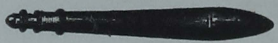
320M5



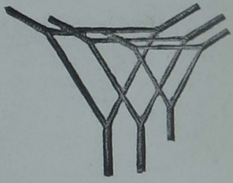
320M7



320M8



320M12



320M10

320M5 Platinum Filter Cones. Flexible, full or three-quarter circle, adjustable to any angle. Perforations .016 to .025 inch.

Diameter, folded, inches	¾	⅞	1	1¼	1½	1¾	2
Weight, approximate, grams	1	1.3	1.7	3.3	4	6.2	6.8

320M6 Platinum Foil. Medium weight is usually used in blowpipe work. Any other weight can be furnished to order.

Size	**Light**	**Medium**	**Heavy**
Thickness, inches	.001	.002	.004
Weight, per square inch, grams	.353	.705	1.411

320M7 Platinum Wire Gauze.

Size, mesh	**150**	**80**	**52**	**45**
Diameter, wire, inches	.0016	.003	.004	.0078
Weight, approximate, per square inch, grams	.25	.45	.47	1.65

320M8 Platinum Spatulas. Made in two sizes, 5 and 8 grams. All other shapes, weights and sizes made to order.

320M9 Platinum Triangles. Solid ends.

Size wire, inches	**.045**	**.045**	**.055**	**.055**	**.064**	**.064**
For crucible, ml.	10	15	20	30	40	60
Weight, grams	5	8	11	12	15	18

320M10 Platinum Triangles. Twisted ends.

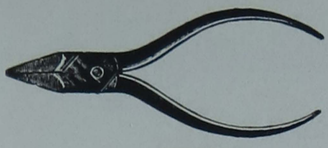
Size, wire, inches	**.045**	**.045**	**.055**	**.055**	**.064**	**.064**
For crucible, ml.	10	15	20	30	40	60
Weight, grams	5	6	11	12	18	20

320M11 Platinum Wire. For blowpipe work No. 26 is usually used.

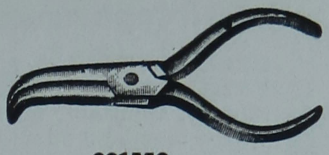
Number B. & S. gauge	**12**	**14**	**16**	**18**	**20**	**22**	**24**
Diameter, inches	.081	.064	.051	.040	.032	.025	.020
Weight per foot, approximate, grams	21.8	13.6	8.6	5.4	3.4	2.1	1.3
Number B. & S. gauge, continued	**26**	**27**	**28**	**30**	**34**	**35**	**36**
Diameter, inches	.016	.014	.013	.010	.006	.0055	.005
Weight per foot, approximate. grams	.85	.65	.56	.33	.12	.10	.08

320M12 Platinum Wire Holders. Used for holding platinum wire. **Each** . . . . . . **$ .75**

Prices on platinum ware will be quoted upon request.



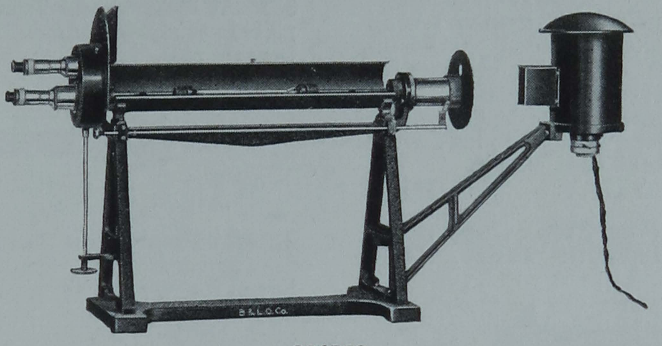
321M1



321M2

321M1 Pliers, Button, Straight Nose. Length, 5 inches. **Each** . . . . **$ .90**

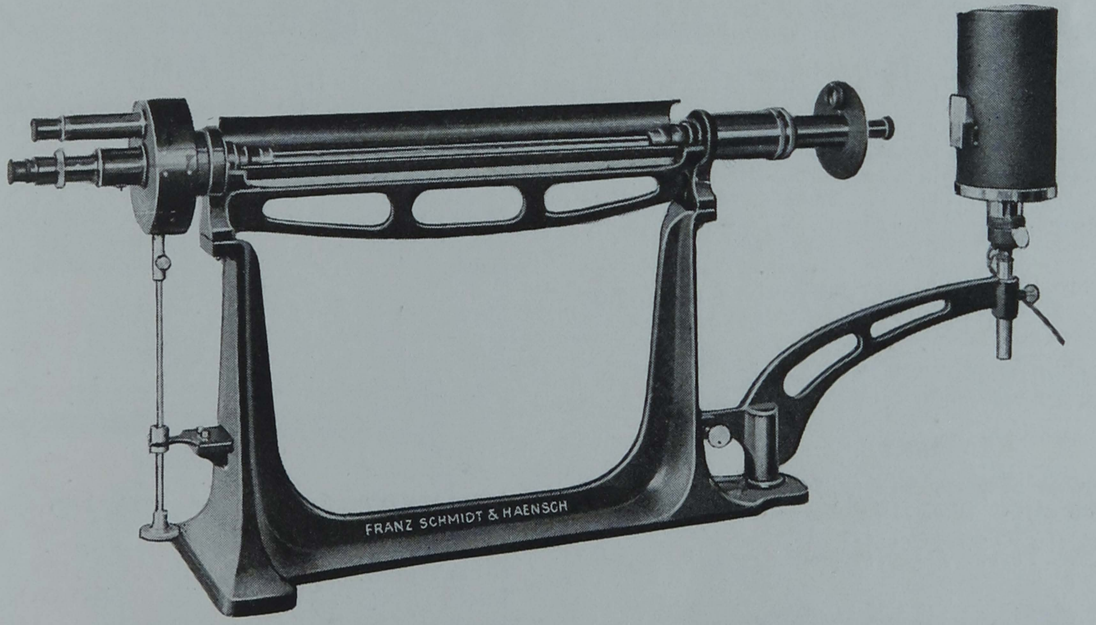
321M2 Pliers, Button, Bent Nose. Length, 5 inches. **Each** . . . . **$ .90**



321M3

321M3 Polariscopes (Saccharimeters), Bausch and Lomb, with Lippich Polarizer. Half-shade type. Designed to meet the needs of sugar chemists. The Lippich polarizer consists of two prisms, a larger of the Glans Thompson type and a smaller half-shade prism which is placed in front of it, covering only one-half of the field. The half-shade angle may be adjusted to any desired value and the dividing line is practically invisible. The polarizer is very sensitive. The International Sugar Scale (Bates Jackson Conversion Factor) is direct-reading and covers a range from -30° to +110°; it is so calibrated as to read sugar degrees based on a standard weight of 26.000 grams of pure sucrose dissolved in 100 ml. of water, solution and polarization to be made at 20°. The scale and vernier are engraved on closely adjacent plates of glass. Vernier is double, providing for both positive and negative readings. Illumination is provided by 100-watt concentrated filament Mazda lamp in well-ventilated lamp house attached by bracket to the trestle support mounting of the polariscope. The glass filter of the same optical properties replaces the bichromate liquid filter. Machine is built to accommodate tubes up to 400 mm. as well as control tubes. Furnished complete with Lippich polarizer, single quartz edge compensator for 400 mm. tubes, illuminating device for white light on 110-volt circuit, and one each, 100 mm., 200 mm., and 400 mm. tubes. In case. **Each** **$590.00**

321M4 Polariscopes (Saccharimeters), Bausch and Lomb, with Jellet Polarizer. Otherwise, same as 321M3. The Jellet polarizer is made of one prism. The half shade angle, approximately 7°, is fixed, and the dividing line is visible. **Each** . . **$590.00**

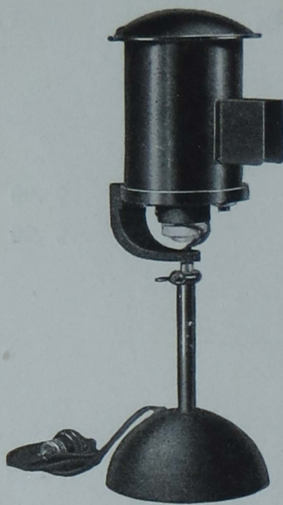


321M5

321M5 Polariscopes (Saccharimeters), Franz Schmidt and Haensch. For quantitative determinations of the proportion of sugar and non-sacchariferous substances in pure, as well as impure raw sugar solutions. With single quartz-wedge compensation; nickeline scales reading from —25° to +100° Ventzke in protective casing; Lippich's half-shadow polarizer and improved illuminating device with solid bichromate glass filter. Mounted on solid trestle stand, consisting of a base made in a single casting on which the polarizing apparatus is mounted, with detachable arm for fitting the observation lamp, and with milled head for moving the quartz-wedge on rod extension. Furnished complete with one each, 100 mm., 200 mm., and 400 mm. tubes, and lamp. **Each** **$526.40**

For polariscope observation tubes, see page 322.
For polariscope observation lamps, see page 322.

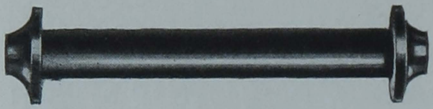
Polariscope Accessories



322M1

322M1 Polariscope Lamps, Electric. Mounted on a separate support, adjustable for height, so that it may be used with any polariscope. It provides for a mean height of filament of 34 cm. The metal base is unusually heavy to give the lamp necessary stability. The bulb is a 100-watt Mazda with a concentrated filament placed in a well ventilated lamp house with a hooded opening in the side containing a plate of ground glass which becomes the light source. Furnished complete with cord, switch and plug for use on 110-volt light circuit.
Each.................... **$30.00**

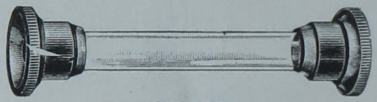
322M2 Polariscope Lamp Bulb, Only. 100-watt. **Each**.... **$1.00**



322M3

322M3 Polariscope Control Plates, Quartz. Optically homogeneous, having plane, parallel surfaces cut perpendicular to axis. Mounted without pressure in brass tubes 120 mm. long. These control plates can be made with approximately any desired sugar value from 20° up to 120°. A Bureau of standards certificate is issued with each.

Degrees	25	80	90	96	100
Each	**$40.00**	**40.00**	**40.00**	**40.00**	**40.00**



322M4

322M5

322M4 Polariscope Tubes, Glass. With metal screw caps.

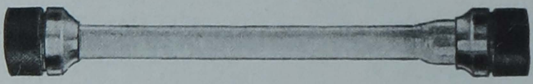
Length, mm.	100	200	400
Each	**$6.00**	**6.25**	**6.75**

322M5 Polariscope Tubes, Glass. With sliding metal caps.

Length, mm.	100	200	400
Each	**$6.00**	**6.50**	**7.00**

322M6 Glass Tubes, Only. For 322M4 and 322M5. Specify which.

Length, mm.	100	200	400
Each	**$1.50**	**1.75**	**2.00**



322M7

322M7 Polariscope Tubes, Glass. Enlarged at one end. With metal screw caps.

Length, mm.	100	200	400
Each	**$6.25**	**6.50**	**7.00**

322M8

322M8 Polariscope Tubes, Glass. Enlarged at one end. With sliding metal caps.

Length, mm.	100	200	400
Each	**$7.25**	**7.50**	**8.00**

322M9 Glass Tubes, Only. For 322M7 and 322M8. Specify which.

Length, mm.	100	200	400
Each	**$2.00**	**2.25**	**2.50**

322M10

322M11

322M10 Polariscope Tubes, Metal. Made of brass, nickel-plated. With metal screw caps.

Length, mm.	100	200	400
Each	**$6.50**	**7.00**	**7.50**

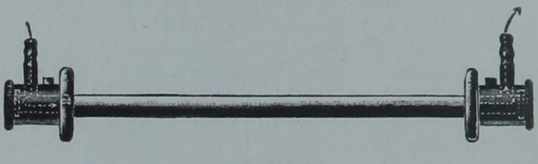
322M11 Polariscope Tubes, Metal. Made of brass, nickel-plated. With sliding metal caps.

Length, mm.	100	200	400
Each	**$8.00**	**8.50**	**9.00**

322M12

322M12 Polariscope Tubes, Metal, Bates. Constructed of brass, nickel-plated. Inside diameter, 9 mm. Both ends enlarged for reception of air bubbles. Used by National Bureau of Standards. Complete with 23.5 mm. optically inactive cover glasses, rubber washers and black oxidized screw caps.

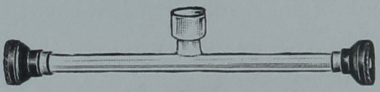
Length, mm.	100	200	400
Each	**$7.00**	**8.00**	**9.00**



322M13

322M13 Polariscope Tubes, Pellet. Brass, nickel-plated. For continuous flow.

Length, mm.	100	200	400
Each	**$14.50**	**15.00**	**16.00**



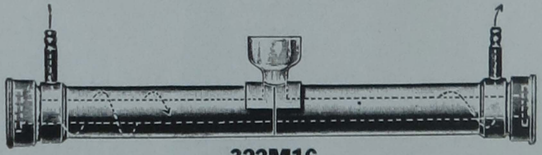
322M14

322M14 Polariscope Tubes, Inversion ,Glass. With tubulature for thermometer, and metal screw caps. Without thermometer.

Length, mm.	100	200	400
Each	**$6.00**	**6.75**	**7.50**

322M15 Glass Tubes, Only. For 322M14.

Length, mm.	100	200	400
Each	**$2.50**	**3.00**	**3.50**



322M16

322M16 Polariscope Tubes, Inversion, Glass. For inversion tests. With tubulature for thermometer, nickel-plated brass water jacket, and metal screw caps.

Length, mm.	100	200	400
Each	**$14.00**	**14.50**	**15.00**

322M17 Polariscope Thermometers, Clerget. For 322M14 and 322M16. Range, 10° to 30° C. in $\frac{1}{10}$°. Length of engraved stem, 8 inches. **Each**.............................. **$3.50**

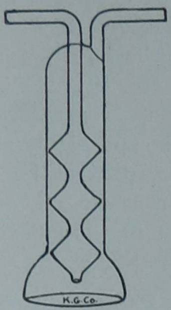
322M18 Polariscope Tube Cover Glasses, Grade A. Optically inactive and with parallel faces.

Diameter, mm.	15.5	23.7
Dozen	**$4.00**	**4.80**

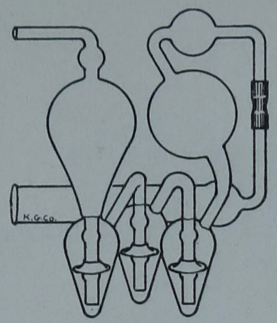
322M19 Rubber Washers for Polariscope Tubes. For use with 322M18 in polariscope tubes.

Diameter, mm.	15.5	23.7
Dozen	**$ .30**	**.40**

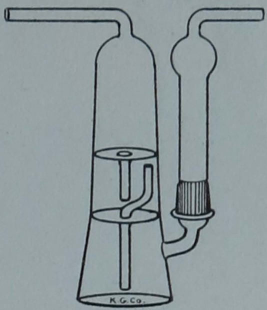
Potash Bulbs



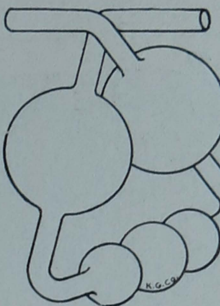
323M1



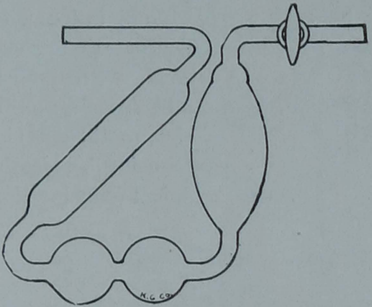
323M2



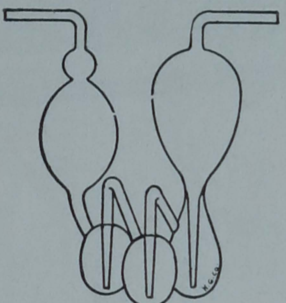
323M3



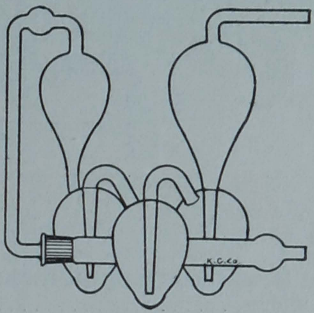
323M4



323M6



323M7



323M8

323M1 Potash Bulbs, Bowen. Has three bulbs with ground edges which retard the flow of bubbles and break them up, giving a greater absorption area. **Each** **$1.60**

323M2 Potash Bulbs, Geissler-Wetzel. With glass baffle plates in the lower bulbs. Drying tube is attached by rubber tubing. **Each** **$2.50**

323M3 Potash Bulbs, Gomberg. With ground-in drying tube. **Each** **$4.00**

323M4 Potash Bulbs, Liebig. With three absorption bulbs; with two safety bulbs. **Each** **$1.00**

323M5 Potash Bulbs, Norris, Plain. Without stopcock. Height overall, 100 mm. **Each** **$1.40**

323M6 Potash Bulbs, Norris. Same as 323M5, except with stopcock. **Each** **$2.00**

323M7 Potash Bulbs, Geissler. Plain, For use with liquid absorbents. Height overall, 115 mm. **Each** **$2.00**

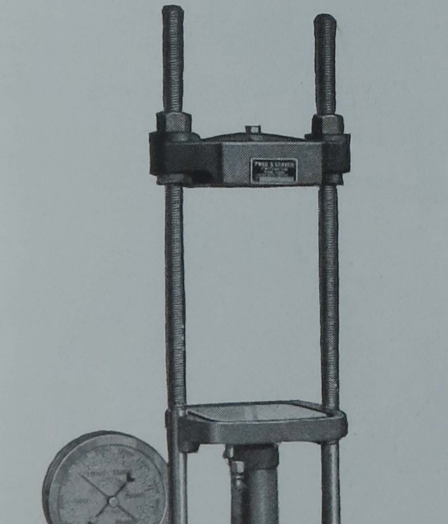
323M8 Potash Bulbs, Geissler. Same as 323M7, except with drying tube ground on to the outlet tube. **Each** . . **$2.50**

Presses

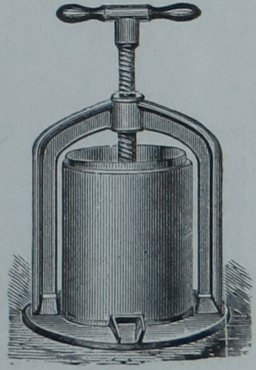
323M9 Presses, Carver, Laboratory. A hydraulic press for general research and small scale experiments. Self-contained hand pump and oil storage for ram are incorporated in it, and the press is designed to set on any laboratory bench or table. It is small but very powerful; good for any load up to 10 tons. Has platens with square bearing surfaces and drainage groove for use when pressing out liquids. Opening between platens may be quickly adjusted by hand, and platens may be closed flush if desired. Press is equipped with a large, accurate bronze case gauge and a maximum hand which indicates maximum pressure attained. Gauge has a working range from 0 to 20,000 pounds applied load. Dimensions: Platens are 6x6 inches square; opening is adjustable 0 to 16 inches (7½ inches between columns); stroke, 6½ inches; length, 16½ inches; width, 15½ inches (front to back); height, 36 inches. **Each** **$170.00**

323M10 Presses, Tincture. Has a wrought-iron screw, machine-cut thread, working in a brass socket to prevent rusting.

Capacity, gallons . . .	½	1	2
Each	**$12.00**	**14.40**	**21.75**

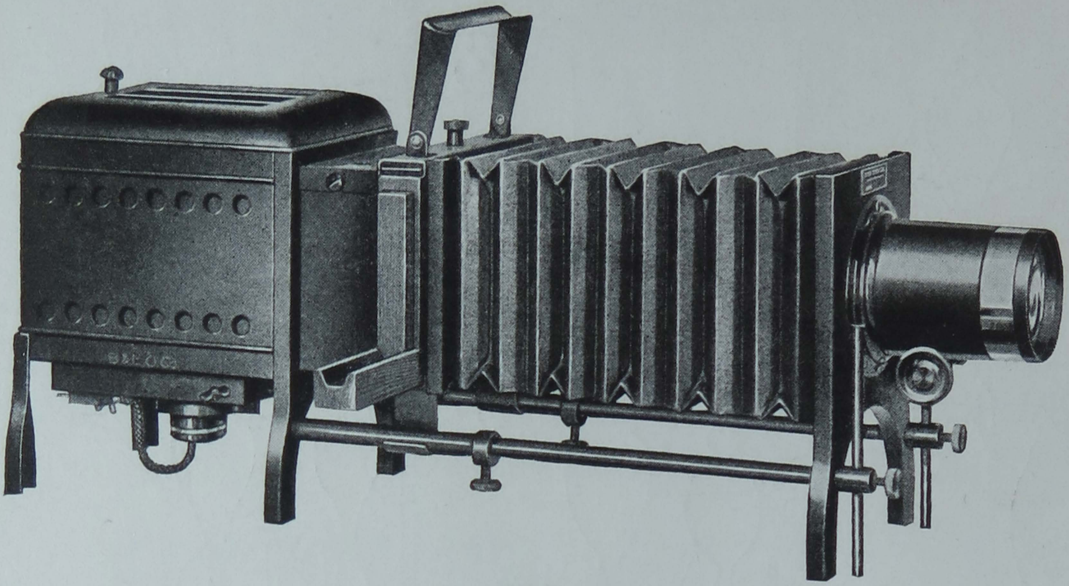


323M9



323M10

Projectors



324M1

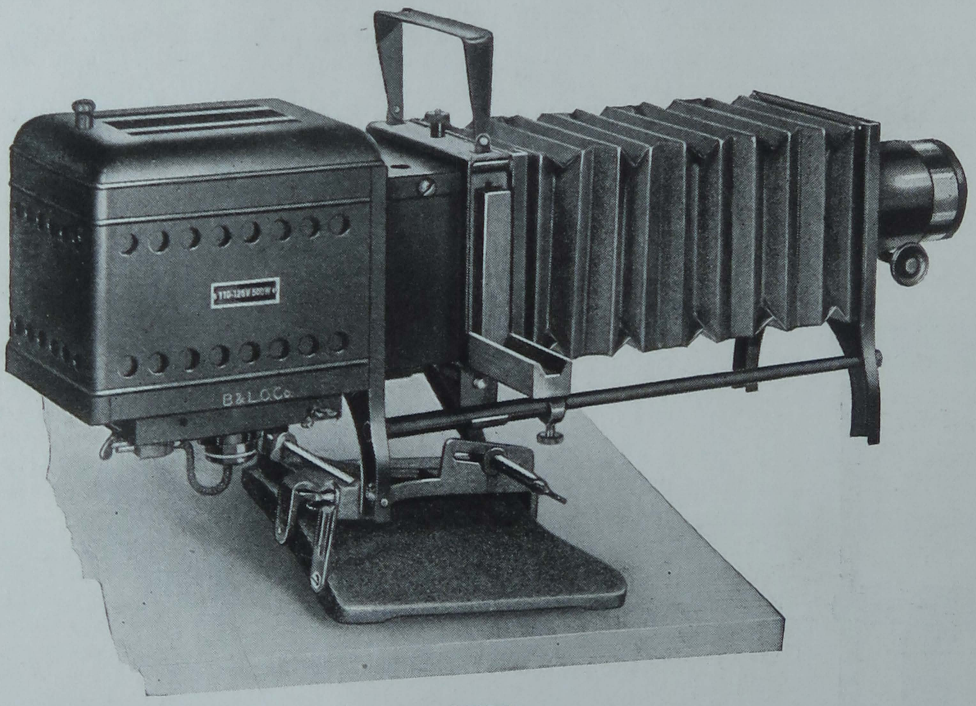
Projectors, B. & L. For use in schools, small auditoriums, etc. Sturdy in construction, compact, easily portable, and highly efficient. A clear, distinct image can be shown on an ordinary screen, under practically daylight conditions.

324M1 Projectors, B. & L. Model B. With 500-watt, 115-volt, pre-focused base Mazda bulb, with glass reflector, 15 feet of extension cord, with connecting plug and switch, double slide carrier, metal carrying case and focusing projection lens in spiral focusing mount.

Projection lens, focus length, inches	4	6	8	10	10	12	15	18	20	22	24
Diameter, inches	1⅝	1⅝	1⅝	1⅝	2⁵⁄₁₆	2⁵⁄₁₆	2⁵⁄₁₆	2⁵⁄₁₆	2⁵⁄₁₆	2⁵⁄₁₆	2⁵⁄₁₆
Each	$57.00	57.00	57.00	57.00	65.00	65.00	65.00	65.00	65.00	65.00	65.00

324M2 Projectors, B. & L., Model B. With 6-volt Mazda lamp with silvered globe, supplementary condenser and 6 feet of extension cord fitted with switch and connecting lugs for attaching to storage battery; double slide carrier; metal carrying case; and 2⁵⁄₁₆-inch diameter, 12-inch focus projection lens, in rack and pinion focusing mount. **Each** $63.00

324M3 Projectors, B. & L., Model B. With two-jet acetylene burner, fitted with ground and polished glass reflector and 6 feet of rubber hose; double slide carrier; metal carrying case; and 2⁵⁄₁₆-inch diameter, 12-inch focus lens in rack and pinion focusing mount. **Each** $62.00



324M4

324M4 Projectors, B. & L., Model BDT. With adjustable tilting base and 500-watt, 115-volt pre-focused Mazda bulb, with ground and polished glass reflector, 15 feet of extension cord with connecting plug and switch, double slide carrier, metal carrying case, and focus projection lens in rack and pinion focusing mount.

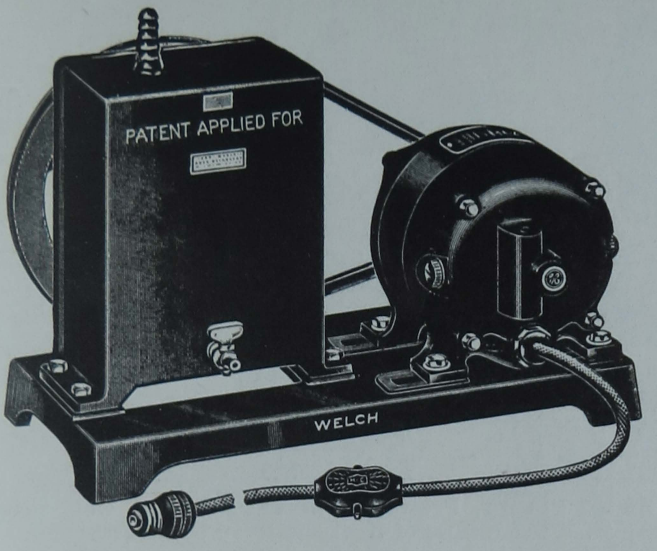
Projection lens, focus length, inches	6	8	10	10	12	15
Diameter, inches	1⅝	1⅝	1⅝	2⁵⁄₁₆	2⁵⁄₁₆	2⁵⁄₁₆
Each	$62.00	62.00	62.00	70.00	70.00	70.00

324M5 Extra 500-watt, 115-volt pre-focused base Mazda bulbs. **Each** $2.75

324M6 Projector Attachment, Overhead. Consists of an upright support with horizontal table for the slide, 1⅝-inch diameter, 7-inch focus projection lens and first surface mirror in adjustable mounting. **Each** $40.00

Note: For Psychrometers, see Hygrometers, page 226.
Note: For Pulverizers, see pages 122 to 129.

Pumps



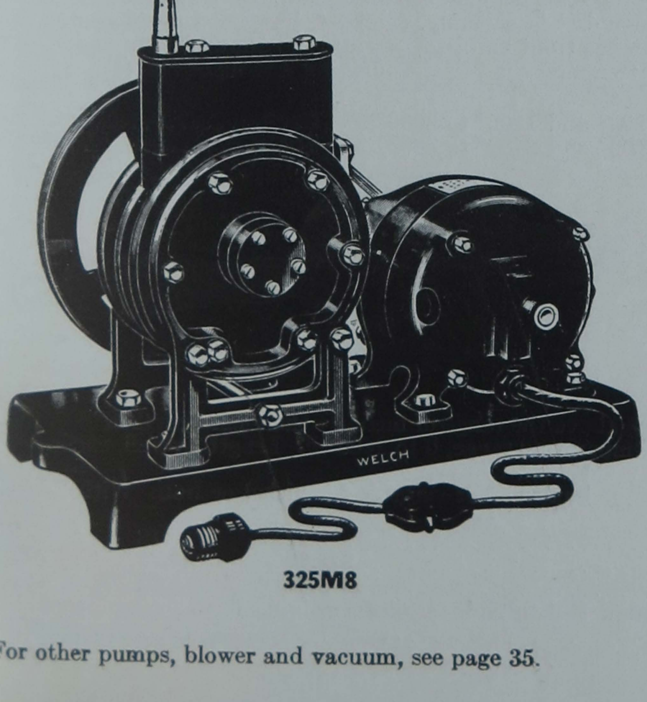
325M2

Pumps, Vacuum, Wegner. Especially adapted for vacuum distillations requiring long continuous operation. Evacuating capacity is 45 liters free air per minute; vacuum to less than .02 mm. A large volume of oil—one-half gallon—assures long operation at the comparatively low speed of 400 R. P. M. A 1725 R. P. M., 1/6 H. P. motor will deliver ample power for continuous operation. The oil can be changed and the pump cleaned without dissembling the pump. The volume of oil dilutes the vapors which are the product of the distillation and protects the mechanism of the pump from corrosion and clogging. A positive oil seal is provided so that no oil can back up into the vacuum system.

325M1 Pumps, Only, Vacuum, Wegner. Not mounted on base. Complete with grooved pulley for special V-belt, supply of oil and directions for use. Without belt. **Each** . . **$39.50**

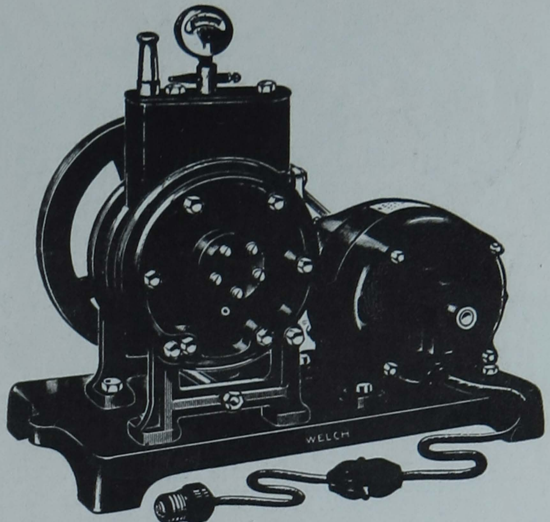
325M2 Pumps, Vacuum, Wegner, Motor-Driven, 110-Volt. Mounted on cast iron base with 1/6 H. P. motor, V-belt, belt tightening device, connecting cord and switch. For operation on 60 cycles A. C. **Each** **$74.50**

325M3 Pumps, Vacuum, Wegner, Motor-Driven, 220-Volt. Otherwise, same as 325M2. **Each** **$74.50**



325M8

For other pumps, blower and vacuum, see page 35.



325M5

Pumps, Vacuum and Pressure, Wegner. Single-stage, motor-driven rotary oil pump, provided with a 9-inch grooved pulley and a V-belt running to the 1/6 H. P. motor. Both motor and pump units are mounted securely on a cast iron base. This compact unit takes a table space of only 8 by 17 inches. The V-belt running in a deep groove provides ample traction so that the pump responds instantly to any load. The weight of the unit is sufficient to give the required stailbity. Pressure is provided by utilizing the exhaust of the pump acting through a fixture screwed in the top of the pump which carries a gauge for registering the pressure, a ball valve which blows off at 20 pounds pressure and an outlet for the pressure stream itself. The vacuum obtained is .02 mm. of mercury. The pump operates at 300 R. P. M., and at this comparatively slow speed will evacuate approximately 1830 cubic inches or 30 liters of air per minute.

325M4 Pumps, Only, Vacuum and Pressure, Wegner. Not mounted on base. Complete with pressure gauge, 9-inch grooved pulley for special V-belt, and supply of oil. Without belt. **Each** **$39.50**

325M5 Pumps, Vacuum and Pressure, Wegner, Motor-Driven, 110-Volt. Mounted on cast iron base with 1/6 H. P. motor with V-belt and tightening device, six feet of connecting cord, snap switch and attachment plug. For 60 cycles A. C. **Each** **$74.50**

325M6 Pumps, Vacuum and Pressure, Wegner, Motor-Driven, 220-Volt. Otherwise same as 325M5. **Each** . . **$74.50**

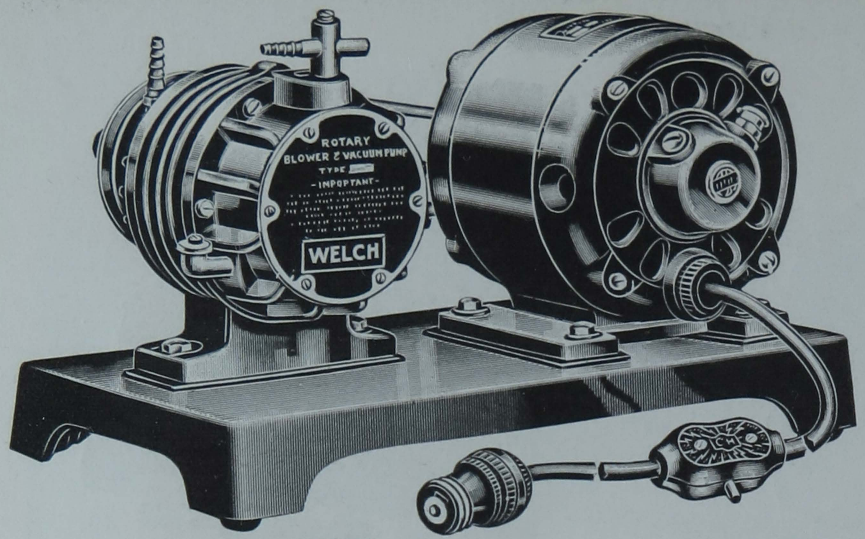
Pumps, High Vacuum, Single Stage. Recommended where high vacuum must be attained rapidly. Consists of a cylindrical chamber in which a cylindrical rotor slightly less in diameter is mounted eccentrically in a carefully ground seat of equal curvature. The rotor carries across its diameter two vanes which are opposed to each other. Their ends are held against the walls of the stator by an internal steel spring. In addition to regular seals provided between exhaust and intake, a special Duo-Seal feature prevents gases from exhausted vessel diffusing back into the intake side. Gases dispensed at the exhaust valve are immediately taken up in the subsequent exhaust operation. Evacuating capacity is 28 liters per minute. All pumps have a vacuum tested to one micron (.001 mm.).

325M7 Pumps, Only, High Vacuum. Not mounted on base. Complete with 9-inch grooved pulley for special V-grooved belt, supply of oil and directions for use. Without belt. **Each** **$45.00**

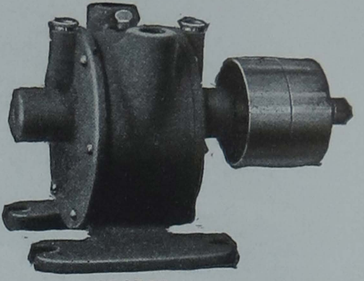
325M8 Pumps, High Vacuum, Motor-Driven, 110-Volt. Mounted on a cast iron base with motor with V-belt and belt tightening device, six feet of connecting cord, snap switch and attachment plug. For operation on 60 cycles A. C. **Each** **$75.00**

325M9 Pumps, High Vacuum, Motor-Driven, 220-Volt. Otherwise same as 325M8. **Each** **$77.50**

Pumps, Continued



326M1



326M2

326M2 Pumps, Pressure and Vacuum, for Belt Drive. Adapted to pressure of from one to 10 pounds, vacuum not exceeding 24 inches.

Size	**1**	**2**
Cubic inches, air per revolution........	20	45
Cubic feet air per minute, max. speed...	6.9	13
R. P. M., max. speed................	600	500
H. P. required at 3 pounds pressure.....	1/8	1/4
H. P. required at 5-8 pounds pressure...	1/4	1/3
H. P. required at 10 pounds pressure....	1/3	1/2
Pulleys, inches......................	4x1	4x1½
Pipe size, inlet and outlet.............	1/2	3/4
Floor space, inches....................	10x6¼	12½x6½
Weight, pounds......................	24	34
Each............................	**$28.00**	**36.00**

326M1 Pumps, Blower and Vacuum, Air Cooled. Suitable for pressure up to 10 pounds, vacuum not exceeding 24 inches. The stator and rotor are machined cast iron and the sliding vanes are of bronze. The use of bronze vanes insures effective sealing, and the design is so arranged that the vanes seat themselves automatically against the stator. The oil reservoir mounted on the end of the pump opposite the pulley has a capacity of 50 ml. The oil is delivered to all bearings under pressure. The pump is air cooled. Capacity of free air is 3.3 cubic feet per minute. Furnished complete with 110-volt A. C., 60-cycle motor, mounted on a base 20 cm. by 33 cm.
Each..**$48.50**

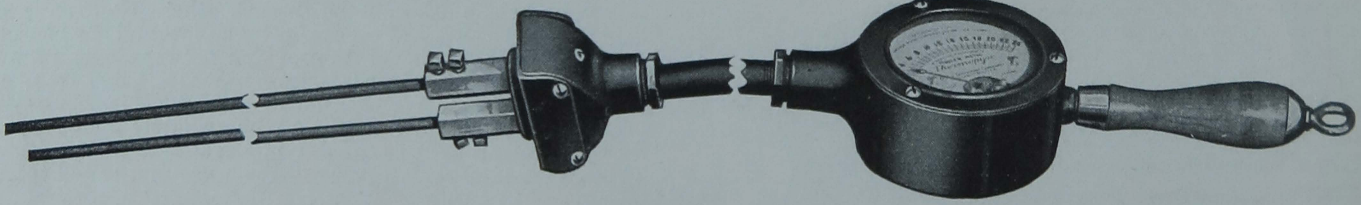
Pyrometers

Pyro Perfect
Pyrometers

326M3

Pyrometers, Radiation. Specially constructed for intermittent or occasional readings in checking instruments permanently installed; controlling furnaces, etc., where the cost of an individual installation is not justified; and controlling objects in a furnace where the temperature of the objects may be different from that of the furnace. Operates on the principle of radiant heat. Used at a distance from the furnace. Parts operate thermo-electrically. Temperatures are measured instantly and automatically by pointing the instrument at the hot body to be measured, by pressing a button and releasing clamping stud. Two standard double ranges meet practically all plant requirements. Readings on the higher scale are obtained by inserting a diaphragm (supplied with each instrument) over the objective lens, thus cutting off a known proportion of radiant heat. The low scale instruments are furnished with quartz lenses so as to reduce radiation absorption to a minimum. The pyrometer is calibrated with tested standards, and temperature readings obtained are correct within 1⅜ of the full scale reading. An individual test certificate accompanies it. The instrument is mounted in a handy, compact, hardwood carrying case with shoulder strap. The case has front and back openings to allow the pyrometer to be used without removal. Pyrometer is 7 inches long by 4⅜ inches in diameter, and weighs 25 ounces.

326M3 Pyrometers, Radiation. With double range of 1000° to 1800° and 1800° to 2600° F. **Each**................**$120.00**
326M4 Pyrometers, Radiation. With double range of 1400° to 2400° and 2400° to 3600° F. **Each**................**$120.00**



326M5

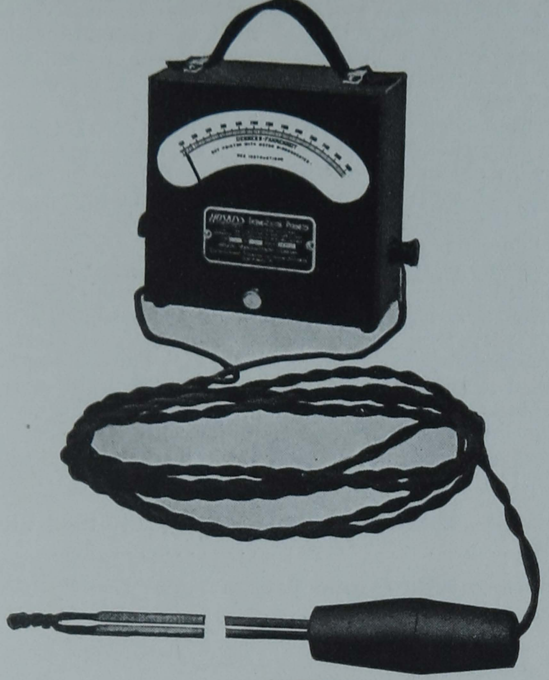
Pyrometers, Taylor, for Molten Metal. For intermittent testing above the range of mercury thermometers (950° F.). Self-contained; portable. Indicator is housed in a cast-aluminum case. Temperature range, 0 to 2400° F. Length overall, exclusive of tips, approximately 40 inches.

326M5 Pyrometers, Taylor, for Molten Metal. For use in brass or bronze. Not suitable for nickel or iron. With 2-gauge renewable tips.

Length of tips, inches	12	18	24
Each	**$45.00**	**46.30**	**47.05**
326M6 Tips, Only. Set of 2	**$ 3.60**	**4.90**	**5.65**

326M7 Pyrometers, Taylor, for Molten Metal. For use in aluminum. Not suitable for nickel or iron. With 2-gauge renewable welded tips. **Each**..**$45.00**
326M8 Welded Tips, Only. Set of 2..**$1.50**

Pyrometers, Continued



327M1

327M5

327M1 Pyrometers, Portable, Low Resistance, Hoskins. Unit consists of meter and thermocouple. The meter is sensitive, rugged and portable, with plain, direct reading scale, range 30° to 2500° F. in 20° divisions, mounted in tightly sealed cast-aluminum case with black crystallized finish. Overall size, 6¼x6x3 inches. Weight, 5 pounds. The thermocouple is supplied with 3-foot, 8-gauge couple wires protected by porcelain insulators. Complete with 20-foot leads. **Each**........**$68.50**

327M2 Pyrometers, Portable, Low Resistance, Hoskins. Same as 327M1, except the scale range is 0° to 1400° C. in 10° divisions. **Each**........**$68.50**

327M3 Meter, Only. Each........**$60.00**

327M4 Thermocouple Wires, Only. 8-gauge, length, 3 feet; with porcelain insulators. **Set**........**$4.50**

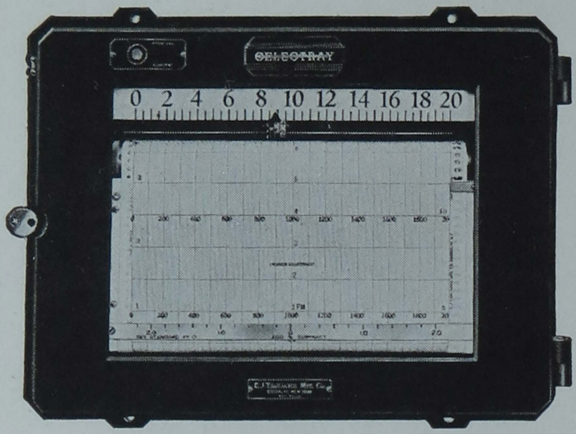
Pyrometers, Indicating, Tag. Photoelectrically operated with a mirror galvanometer. A bright light on the window facilitates reading indications from a distance or very accurately from close up by means of a thin dark line in the middle of the light beam. Scale is 15 inches long and accurate to 0.1%. The case is black enameled aluminum, dust-and-fume proof, with molded Bakelite door, universal mounting, and enclosed connecting terminals, conduit openings top of left side, and external adjustment on locked door.

327M5 Potentiometer Type, Single Range. With lamp on 110-volt, 60-cycle, transformer. **Each**........**$125.00**
327M6 Potentiometer Type, Double Range. With lamp on 110-volt, 60-cycle, transformer. **Each**........**$165.00**
327M7 Potentiometer Type, Single Range. With lamp on battery within case. **Each**........**$125.00**
327M8 Potentiometer Type, Double Range. With lamp on battery within case. **Each**........**$165.00**
327M9 Wheatstone Bridge Type, Single Range. With lamp on 110-volt, 60-cycle, transformer. **Each**........**$125.00**
327M10 Wheatstone Bridge Type, Double Range. With lamp on 110-volt, 60-cycle, transformer. **Each**........**$165.00**
327M11 Wheatstone Bridge Type. Single Range. With lamp on battery within case. **Each**........**$125.00**
327M12 Wheatstone Bridge Type, Double Range. With lamp on battery within case. **Each**........**$165.00**
Note: Potentiometer type usually used with thermocouples and wheatstone bridge type with resistance thermometers.

Pyrometers, Indicating Controllers, Tag. For continuous temperature control. Operated by means of a slight deflection of a narrow light beam off or on the edge of a phototube. The circular scale and slide-wire are 15 inches long and temperatures can be read to 0.1% of the range. The scale appears through a glass window, and temperatures are indicated by a brilliant red, white or green line of light on ground glass just above the circular edge. For 110 volts, 60 cycles.

327M13 Potentiometer Type, Single Point. "On-off" or 2-position control. **Each**........**$165.00**
327M14 Potentiometer Type, Single-Point. "On-off" 25-ampere mercury switch single-pole-single-throw. **Each**....**$180.00**
327M15 Potentiometer Type, Single-Point. 3-Position control. **Each**........**$190.00**
327M16 Wheatstone Bridge Type, Single-Point. "On-off" or 2-position control. **Each**........**$165.00**
327M17 Wheatstone Bridge Type, Single-Point. "On-off" 25-ampere mercury switch single-pole-single-throw. **Each**........**$180.00**
327M18 Wheatstone Bridge Type, Single-Point. 3-Position control. **Each**........**$190.00**
327M19 Potentiometer Type, Two-Point. "On-off" or 2-position control. Both control points at same temperature. **Each**........**$235.00**
327M20 Potentiometer Type, Two-Point. "On-off" or 2-position control. Both control points set independently. **Each**........**$275.00**
327M21 Wheatstone Bridge Type, Two-Point. "On-off" or 2-position control. Both control points at same temperature. **Each**........**$235.00**
327M22 Wheatstone Bridge Type, Two-Point. "On-off" or 2-position control. Both control points set independently. **Each**........**$275.00**

Pyrometers, Continued



328M1

Pyrometers, Recording, Tag, One-Point. A sensitive mirror galvanometer is the primary controlling element in which an inertialess beam of light takes the place of the customary metal boom or pointer. The beam of light from the galvanometer in moving on and off a phototube passes the "controlling edge" of a screen, thus operating relays which in turn control a reversing motor which drives the moving contact of the Wheatstone bridge or potentiometer. The phototube is not a calibrated element, but serves only to detect the direction of the light-beam and bring the galvanometer to zero deflection according to the well-known null method of balancing a "photo-electric potentiometer" in the sense that a balance of photoelectric current is implied.

The galvanometer is free at all times from mechanical engagement; this fact, together with its low moment of inertia, permits rapid balancing and control actions. A high current sensitivity permits the use of high resistance or of very long thermocouple leads without material loss of accuracy in the balancing. Or, on occasion, a very low scale range does not require the use of a very low resistance and its resultant disadvantages.

The case is black enameled aluminum, dust-and-fume-proof with universal mounting, inclosed connection terminals with conduit openings top and bottom near back, external "on-off" switch and a standardizing knob. For A. C., only, 110 volts, 60 cycles.

328M1 Pyrometers, Potentiometer Type. Usually used with thermocouples. **Each**........**$250.00**

328M2 Pyrometers, Wheatstone Bridge Type. Usually used with resistance thermometers. **Each**........**$250.00**

Pyrometer Accessories

Pyrometer Thermocouples, Base Metal. Without protection tube or head. Samples from every coil of wire are tested by the National Bureau of Standards.

B. & S. Gauge number	20	14	14	8
Diameter, inches	.032	.064	.064	.128
Double bore insulating tubing, outside diameter, inches	3/16	....	1/4	....
Double bore porcelain insulators, outside diameter, inches	....	25/64	....	33/64
328M3 Iron Constanstan,				
2-foot length	**$2.30**	**2.55**	**2.65**	**2.90**
Longer lengths, add per ft.	**$ .60**	**.60**	**.65**	**.60**
328M4 Chromel-Alumel.				
2-foot length	**$2.80**	**3.05**	**2.85**	**3.45**
Longer lengths, add per ft.	**$ .75**	**.75**	**.65**	**.75**
328M5 Copper Constantan.				
2-foot length	**$2.30**	**2.55**	**2.65**	**2.90**
Longer lengths, add per ft.	**$ .60**	**.60**	**.65**	**.60**

Note: An 18-inch base metal thermocouple will fit an 18-inch protection tube.

Pyrometer Thermocouples, Rare Metal, Platinum: Platinum- 10% Rhodium.

Diameter, inches	0.20	0.22
328M6 Bare. Inch	**$1.30**	**1.10**
328M7 Protected. With high temperature double bore porcelain insulating tubing, outside diameter, 3/16-inch. **Inch**	**$1.35**	**1.15**
328M8 Protected. With high temperature double bore porcelain insulating tubing 1/4 inch outside diameter. **Inch**	**$1.36**	**1.16**

Note: Add one and one-half inches to length of protection tube to get length of rare metal thermocouple.

Pyrometer Thermocouple Insulators, Porcelain.

328M9 Two-Hole, Oval. 5/16x1/2 inch. Length, one inch. For couple No. 8. **Each**........**$ .02**
Thousand........**$17.50**

328M10 Two-Hole, Oval. 7/32x3/8 inch. Length, one inch. For couple No. 14. **Each**........**$ .02**
Thousand........**$15.00**

328M11 Double Bore Tubing. Outside diameter, 1/4 inch. Length, 12 inches. For couple No. 14. **Each**........**$ .30**

Pyrometer Thermocouple Protection Tubes. For base metal thermocouples. Threaded at open end. Supplied in lengths, one to 9 feet, in multiples of 6 inches.

No. 8 B. & S. gauge thermocouples require 1/2-inch standard pipe size or 5/8-inch inside diameter.

No 14 B. & S. gauge thermocouples require 1/4-inch standard pipe size or 3/8-inch inside diameter.

No. 20 B. & S. gauge thermocouples require 1/8 standard pipe size or 1/4-inch inside diameter.

328M12 Seamless Steel. For high temperature service. Tested, gas-tight (1250° F. in oxidizing atmosphere).

Outside diameter, inches	27/32	17/32	13/32
S. P. T. for thermocouple head, inches	1/2	1/4	1/8
2-foot length	**$2.00**	**1.70**	**1.60**

328M13 Seamless Steel. Extra strong pipe sizes.

Outside diameter, inches	1 3/64	21/32
S. P. T. for thermocouple head, inches	3/4	3/8
2-foot length	**$4.50**	**3.45**

328M14 Iron.

Outside diameter, inches	27/32	17/32
S. P. T. for thermocouple head, inches	1/2	1/4
2-foot length	**$1.50**	**1.30**

328M15 Die Cast Nickel Chromium.

Outside diameter, inches	1 1/8	7/8
S. P. T. for thermocouple head, inches	3/4	1/2
2-foot length	**$9.00**	**9.00**

328M16 Welded Nickel Chromium.

Outside diameter, inches	13/32	17/32	21/32
S. P. T. for thermocouple head, inches	1/8	1/4	3/8
2-foot length	**$9.00**	**10.00**	**11.00**

328M17 Combination Seamless Steel and Nickel Chromium. Closed on alloy end. Outside diameter, 1 3/64 inches. S. P. T. for thermocouple head, 3/4 inch. 2-ft. length..**$12.00**

328M18 Calorized Steel. Outside diameter, 27/32. S. P. T. for thermocouple head, 1/2 inch. 2-foot length........**$4.50**

328M19 Stainless Steel.

Diameter, outside, inches	27/32	21/32
S. P. T. for thermocouple head, inches	1/2	3/8
2-foot length	**$8.00**	**7.00**

Pyrometer Accessories, Continued

Pyrometer Thermocouple Protection Tubes, Primary. Plain tubing of high temperature porcelain for platinum: platinum-rhodium. Closed at one end.

Length, inches	6	12	18	24	30	36
329M1 Tubes. Diameter, inches: outside, 7/16; inside, 1/4. **Each**	**$2.00**	**3.00**	**4.50**	**6.00**	**8.50**	**10.00**
329M2 Tubes. Diameter, inches: outside, 5/8; inside, 7/16. **Each**	**$2.00**	**3.50**	**5.00**	**6.50**	**9.00**	**10.50**
329M3 Tubes. Diameter, inches: outside, 3/4; inside, 9/16. **Each**		**$3.50**	**5.00**	**6.50**	**8.00**	**10.50**

Pyrometer Thermocouple Protection Tubing, Insulating, Primary. Round double bore tubing of high temperature porcelain for platinum: platinum-rhodium.

Length, inches	6	12	18	24	30	36
329M4 Tubing. Diameter, outside, 3/16 inch. **Each length**	**$ .30**	**.60**	**.90**	**1.20**	**1.50**	**1.80**
329M5 Tubing. Diameter, outside, 1/4 inch. **Each length**	**$ .40**	**.80**	**1.20**	**1.60**	**2.00**	**2.40**

Pyrometer Thermocouple Protection Tubes, Secondary. High temperature refractory.

329M6 Refractory Porcelain. Closed at one end with 2-inch flange at open end. Diameter, inches, outside, 1 3/8; inside, 1.

Length, inches	6	12	18	24	30	36
Each	**$2.50**	**4.50**	**6.50**	**8.50**	**10.75**	**12.75**

329M7 Refractory Porcelain. Closed at one end with 2 1/4-inch flange at open end. Diameter, inches: outside, 1 3/4; inside, 1.

Length, inches	6	12	18	24	30	36
Each	**$3.50**	**6.50**	**9.50**	**12.50**	**15.50**	**18.50**

329M8 Coarse-Grained Mullite. Closed at one end. Diameter, inches: outside, 3; inside, 1.

Length, inches	12	18	24	30	36
Each	**$3.50**	**4.50**	**5.50**	**8.00**	**11.00**

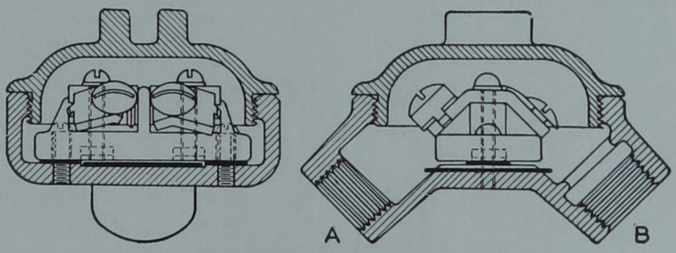
329M9 Silicon Carbide. Closed at one end. Diameter, inches: outside, 1 3/4; inside, 1.

Length, inches	12	18	24	30
Each	**$2.75**	**3.75**	**3.50**	**5.50**

329M10 Graphite Mixture. Closed at one end. Diameter, inches: outside, 1 3/4; inside, 1.

Length, inches	12	18	24	30	36
Each	**$4.00**	**5.00**	**7.00**	**9.00**	**11.00**

329M11 Silica Block, Two Holes. 5 to 6 inches square tapered. Inside diameter, one inch. Length, 14 inches. **Each . . . $5.00**



329M12 (A) toward couple (B) to leads

329M12 Pyrometer Thermocouple Heads. Weather-proof. Complete with connectors on porcelain block in aluminum housing.

Diameter, inches, connector A	1/2	1/2	3/4	3/4
Diameter, inches, connector B	1/2	3/4	1/2	3/4
Complete	**$2.50**	**2.50**	**2.50**	**2.50**

329M13 Pyrometer Resistance Thermometer Heads. Weather-proof. With connectors and three terminals on porcelain block in aluminum housing.

Diameter, inches, connector A	1/2	3/4
Diameter, inches, connector B	1/2	1/2
Complete	**$2.50**	**2.50**

329M14 Metal Conduit Extension. Flexible. Length, 18 inches, including connectors. **Each . . . $1.00**

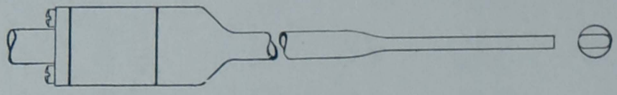
Duplex Extension Leads. Each wire, No. 14 B. & S. gauge, single strand. Performite covered enameled wire, weather-proof, flame-proof. Braided overall. For use with thermocouple as shown below.

Length, feet	1 to 100	101 to 1000	1001 or over
329M15 Iron Constantan. Per foot	**$ .10**	**.09**	**.08**
329M16 Copper Constantan. Per foot	**$ .10**	**.09**	**.08**
329M17 Chromel-Alumel. Per foot	**$ .10**	**.09**	**.08**

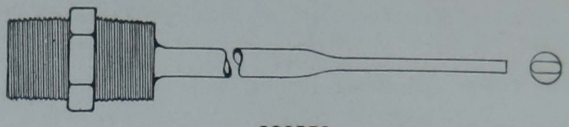
Duplex Extension Leads. Each wire No. 14 B. & S. gauge, single strand, Enameled wire with asbestos fire-proof insulation on each conductor and braided overall. For use with thermocouple as shown below.

Length, feet	1 to 100	101 or over
329M18 Iron-Constantan. Per foot	**$ .20**	**.15**
329M19 Chromel-Alumel. Per foot	**$ .20**	**.15**
329M20 Platinum-10% Rhodium. Per foot	**$ .20**	**.15**

Pyrometer Accessories, Continued



330M2



330M3

Pyrometer Resistance Thermometers, Tag. Platinum. Range, -300° to 1000° F.

330M1 Pyrometer Thermometers. Quick acting. In plain 18-8 stainless steel tube without pressure fitting. Sensitive part about 1½ inches long, ⅜ inches wide, and ⅛ inch thick. Lead end threaded to fit ½-inch thermocouple head.

Lengths, inches	up to 12	13 to 24	25 to 36
Each	**$15.00**	**17.00**	**19.00**

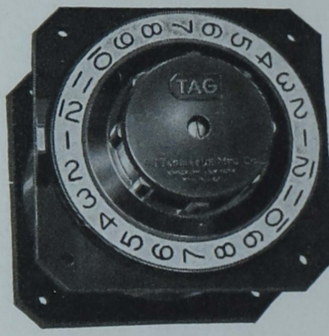
330M2 Pyrometer Thermometers. Same as 330M1, except with 10 feet of lead, including special head.

Lengths, inches	up to 12	13 to 24	25 to 36
Each	**$15.00**	**17.00**	**19.00**

330M3 Pyrometer Thermometers. Same as 330M1, except with ¾-inch standard pipe thread pressure fitting.

Lengths, inches	up to 12	13 to 24	25 to 36
Each	**$18.00**	**20.00**	**22.00**

330M4 Pyrometer Thermometers. For room temperature. **Each** **$22.00**



330M5

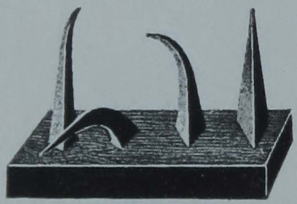
330M5 Pyrometer Rotary Double-Post Switches, 12-Point. For use with thermocouples. In dust- and fume-proof double housing. Outer housing for flush, wall or table mounting. Bottom connected. Gold alloy contacts. **Each** **$30.00**

330M6 Pyrometer Rotary Switches, 6-Point. Otherwise, same as 330M5. **Each** **$25.00**

330M7 Pyrometer Rotary Switches, 12-Point. Same as 330M5, except for resistance thermometers. **Each** **$30.00**

330M8 Pyrometer Rotary Switches, 6-Point. Otherwise, same as 330M7. **Each** **$25.00**

Pyrometer Cones



330M9

330M9 Pyrometer Cones, Seger. For determination of furnace or kiln temperature and studies of heat distribution. Fusion temperatures correspond with cone numbers as assigned by the National Bureau of Standards.

Cone number	**022**	**021**	**020**	**019**	**018**	**017**	**016**	**015**	**014**	**013**	**012**	**011**
Degrees, Centigrade	575	600	625	650	675	700	725	750	775	800	825	850
Degrees, Fahrenheit	1065	1110	1155	1200	1245	1290	1335	1380	1425	1470	1515	1560

Cone number, continued	**010**	**09**	**08**	**07**	**06**	**05**	**04**	**03**	**02**	**01**	**1**	**2**
Degrees, Centigrade	875	900	925	950	975	1000	1025	1050	1075	1090	1105	1120
Degrees, Fahrenheit	1605	1650	1695	1740	1785	1830	1875	1920	1965	1995	2020	2050

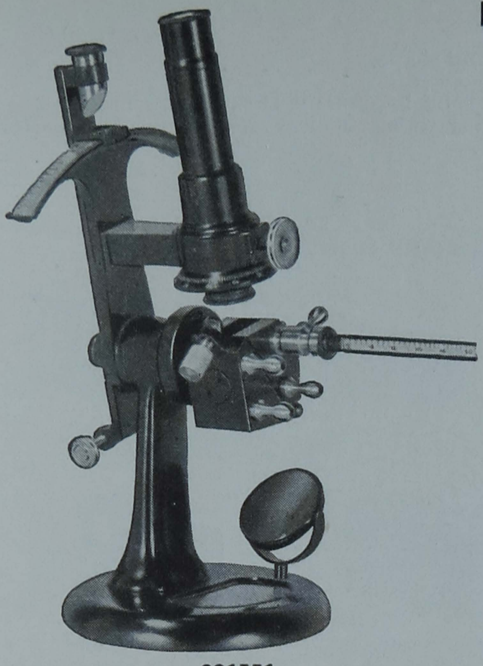
Cone number, continued	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
Degrees, Centigrade	1135	1150	1165	1180	1195	1210	1225	1240	1265	1290	1315
Degrees, Fahrenheit	2075	2100	2130	2155	2185	2210	2235	2265	2310	2355	2400

Cone number, continued	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**22**	**24**	**26**	**27**
Degrees, Centigrade	1340	1365	1390	1415	1440	1465	1490	1515	1540	1565	1590
Degrees, Fahrenheit	2445	2490	2535	2580	2625	2670	2715	2760	2805	2850	2895

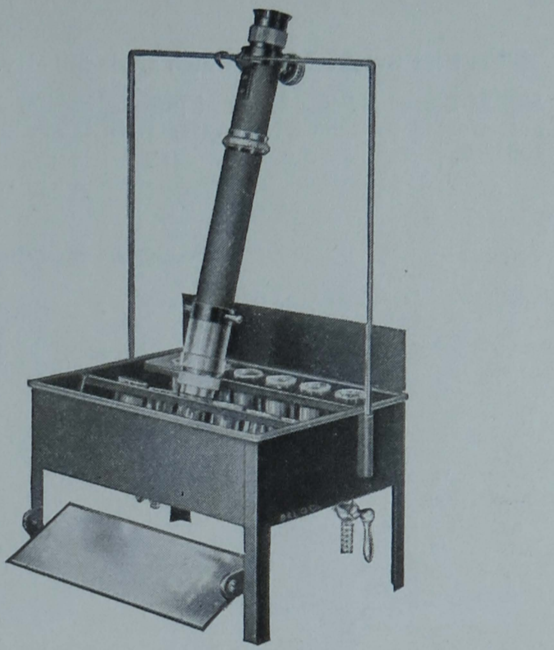
Cone number, continued	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**
Degrees, Centigrade	1615	1640	1665	1690	1715	1740	1765	1790	1815	1840	1865
Degrees, Fahrenheit	2940	2985	3030	3075	3120	3165	3210	3255	3300	3345	3390

Numbers 022 to 19, inclusive. **Each**	**$ .03**
Box of 50 of one number	**$1.27**
Numbers 20 to 38, inclusive. **Each**	**$ .06**
Box of 50 of one number	**$2.55**

Refractometers



331M1



331M5

331M1 Refractometers, Abbe, Bausch and Lomb. Designed for use with white light for determination of refractive indices of transparent liquids and solids and also for work with dark-colored liquids and opaque or translucent plastics. Refractive indices can be determined between nD = 1.3 and nD = 1.7 and can be read directly from the graduated circle, accuracy of reading being to about 2 units in the fourth decimal place.

Consists mainly of the telescope, Abbe prisms, sector and compensation prisms. The Abbe prisms are two similar flint glass prisms of high refractive index which are cemented in hollow, water-jacketed mounts, so designed that water can be circulated aroung the prisms for temperature control. Rigidly attached to the telescope is a sector which has a German silver scale graduated directly in terms of refractive index of the D line at a temperature of 20° C. The upper end of the alidade which rests against the sector bears a reference line which when the arm is rotated moves along the index scale. The fine adjustment provides a slow motion with the cross-hairs. The compensator prisms are two direct vision Amici prisms that rotate in opposite directions about the optical axis of the telescope. The pinion head rotates the prisms—the amount of rotation being read off on an arbitrary scale.

Complete with stem thermometer, bottle of monobromonaphthelene, screw driver and test plate. In case.
Each.. **$265.00**

331M2 Refractometers, Abbe, Bausch and Lomb. Same as 331M1, except has both regular and sugar scales. **Each**... **$285.00**

331M3 Constant Temperature Control Equipment. For 331M1 and 331M2. Consists of a constant pressure tower, a valve to regulate the flow, and a variable electric heater. Delivers approximately one to two liters per minute at the desired temperature. The temperature is adjustable from 5° C. of the temperature of the input to 40° C. For 110 volts A. C. or D. C. **Each**.... **$45.00**

331M4 Thermometers. For 331M1 and 331M2. Range, 0° to 75° C. divided in 1° in threaded jacket. **Each**........... **$4.50**

331M5 Refractometers, Dipping, Bausch and Lomb. An immersion type of instrument designed to cover a small index range with a higher accuracy than is possible with 331M1. The refractive indices of liquids may be determined within the range nD 1.32539 to 1.54409 by a series of six prisms.

Consists mainly of telescope, compensator and immersion prism. The telescope has an objective of comparatively long focus, the value of which is accurately controlled, and the eyepiece contains a scale engraved in arbitrary equal divisions. The refractive index may be read with an accuracy of 0.00003 to 0.00004 depending upon the portion of the scale being read and the prism in use.

The compensator is a single Amici prism mounted inside the body tube below the objective and rotatable by a circular collar equipped with a scale of 10 divisions by which approximate comparisons of dispersion may be made.

Immersion prisms are supplied in ranges as listed below; prism A, range 1.32539-1.36640 being supplied with the instrument.

Complete in case with metal beaker and tables for transposing scale divisions into refractive indices, and table of readings for distilled water. Without heating trough.
Each.. **$180.00**

331M6 Prisms, Only. For 331M5. With the exception of prism B, any prism may be ordered with the instrument either with or without prism A. Prism B requires prism A for adjustment and cannot be ordered alone. If ordered subsequently to the purchase of the instrument, the refractometer must be sent in for correct fitting.

Designation	**B**	**C**	**D**	**E**	**F**
Range nD	1.36428-1.40608	1.39860-1.43830	1.43620-1.47560	1.47320-1.51189	1.50969-1.54409
Each	**$32.50**	**32.50**	**32.50**	**32.50**	**32.50**

331M7 Prisms, Auxiliary. For 331M5. For tests where the amount of liquid is limited. Fitted to the main prism by use of the metal beaker.

Number	**1**	**2**	**3**
For use with prisms	C, D and E	F	A and B
Each	**$3.80**	**3.80**	**3.80**

331M8 Heating Troughs. For 331M5. With glass plate in bottom, mirror and 24 beakers. **Each**.................... **$24.00**

331M9 Metal Beakers. For 331M5. Used to fit auxiliary prisms over the prism mount. **Each**........................ **$ .20**

331M10 Thermometers. For 331M8. Range 15-25° C., divided in ⅕°, 8 inches long, with red line at 17.50° C. **Each**.. **$4.50**

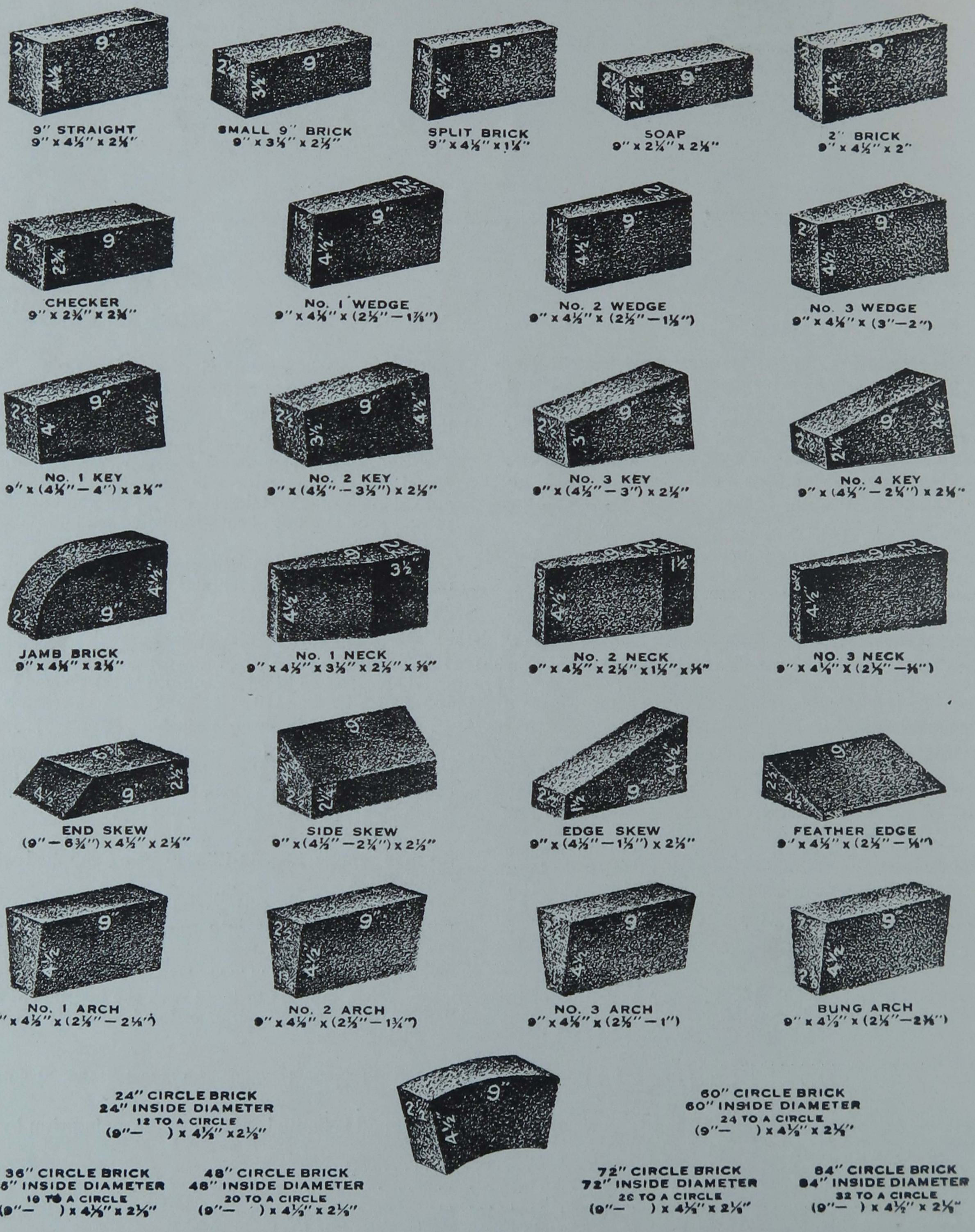
331M11 Constant Temperature Control Equipment. For 331M5. The water from the control unit is passed directly into a tank in which are suspended glass beakers containing the liquids to be measured. The beakers are supported on two shelves, each carrying six specimens. This permits twelve samples to be brought to temperature at the same time. **Each**........... **$45.00**

Refractories

332M1 Fire Brick. Made of high grade fire clay. Uniform in texture, size and shape.

332M2 Silcar Brick. Made of pure carbide of silicon; owing to its density and hardness it is extremely resistant to abrasion, not affected by acids or alkalies. Withstands high temperatures, maintaining its mechanical strength until dissociation, about 4064° F.

Shapes as Adopted by The American Refractories Institute



9" STRAIGHT
9" x 4½" x 2½"

SMALL 9" BRICK
9" x 3½" x 2½"

SPLIT BRICK
9" x 4½" x 1¼"

SOAP
9" x 2¼" x 2½"

2" BRICK
9" x 4½" x 2"

CHECKER
9" x 2¾" x 2¾"

No. 1 WEDGE
9" x 4½" x (2½" — 1⅞")

No. 2 WEDGE
9" x 4½" x (2½" — 1½")

No. 3 WEDGE
9" x 4½" x (3" — 2")

No. 1 KEY
9" x (4½" — 4") x 2½"

No. 2 KEY
9" x (4½" — 3½") x 2½"

No. 3 KEY
9" x (4½" — 3") x 2½"

No. 4 KEY
9" x (4½" — 2¼") x 2½"

JAMB BRICK
9" x 4½" x 2½"

No. 1 NECK
9" x 4½" x 3½" x 2½" x ⅝"

No. 2 NECK
9" x 4½" x 2½" x 1½" x ⅝"

NO. 3 NECK
9" x 4½" x (2½" — ⅝")

END SKEW
(9" — 6¾") x 4½" x 2½"

SIDE SKEW
9" x (4½" — 2¼") x 2½"

EDGE SKEW
9" x (4½" — 1½") x 2½"

FEATHER EDGE
9" x 4½" x (2½" — ⅛")

No. 1 ARCH
9" x 4½" x (2½" — 2⅛")

No. 2 ARCH
9" x 4½" x (2½" — 1¾")

NO. 3 ARCH
9" x 4½" x (2½" — 1")

BUNG ARCH
9" x 4½" x (2½" — 2⅜")

24" CIRCLE BRICK
24" INSIDE DIAMETER
12 TO A CIRCLE
(9" —   ) x 4½" x 2½"

60" CIRCLE BRICK
60" INSIDE DIAMETER
24 TO A CIRCLE
(9" —   ) x 4½" x 2½"

36" CIRCLE BRICK
36" INSIDE DIAMETER
16 TO A CIRCLE
(9" —   ) x 4½" x 2½"

48" CIRCLE BRICK
48" INSIDE DIAMETER
20 TO A CIRCLE
(9" —   ) x 4½" x 2½"

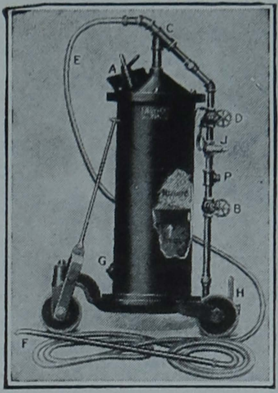
72" CIRCLE BRICK
72" INSIDE DIAMETER
26 TO A CIRCLE
(9" —   ) x 4½" x 2½"

84" CIRCLE BRICK
84" INSIDE DIAMETER
32 TO A CIRCLE
(9" —   ) x 4½" x 2½"

Refractories, Continued

HYTEMPITE
QUIGLEY FURNACE SPECIALTIES CO.
HYTEMPITE
SEALED IN STEEL

333M1



333M6

333M1 Hytempite. A scientifically compounded high temperature cement of refractory plastic material for bonding fire brick and kindred uses. It forms a strong union between the materials to be joined, sets at normal temperature and retains its strength regardless of the heat it is subjected to up to about 3100° F. (1700° C.) or to a temperature at which the best quality fire brick loses its strength and becomes soft.

It trowels easily, and insures a tight wall or structure which will not admit the passage of gases or any foreign substance such as dust, ashes, etc. Requires about 300 pounds to lay up 1000 standard fire brick.

It strengthens the wall, will withstand the action of expansion and contraction and can be put under heat while wet without injury. Withstands the cutting action of flames and is especially recommended for oil furnaces where the gases are generally of high velocity. It can be used wherever fire brick or tile are used. It is used for laying fire brick and tile; for tightening old walls and arches, sealing openings in new walls, stacks, etc., to make them air tight, lining doors, etc. Hot patching in furnaces, gas retorts, etc. Bonding new courses of a veneer of fire brick to old walls. Prevents leaks between bricks and iron work. Excellent for dip joints.

It is also used as a wash for surfacing brick work; for lining ladles, patching or building up tuyeres.

Size	25-lb. drums	100-lb. drums	500-lb. drums
Cwt.	**$7.00**	**5.00**	**4.25**

333M2 Monoline. First quality plastic fire brick in easy-working, ready-to-use form. Highly refractory, practically neutral as to expansion and contraction, and lasts longer in actual service. For monolithic (jointless) furnace linings, and for furnace repair jobs. In 100-pound carton. **Cwt.** **$3.80**

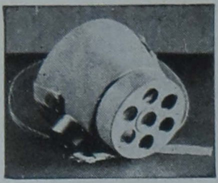
333M3 Hearth-Crete. A special patented chrome-base castable refractory of outstanding merit for building monolithic hearths or bottoms in forging and other steel heating furnaces; for monolithic sidewalls in copper refining furnaces; for making burner blocks subject to severe conditions, and for many other purposes. In 175-pound bags. **Cwt.** **$6.25**

333M4 Insulcrete. A light weight cellular insulating refractory concrete for casting furnace linings, door linings, heat shields, shapes, covers, and kindred items; recommended for temperatures up to 2500° F. No cutting, fitting or ramming. One inch of Insulcrete equals about 4 inches of fire brick in insulating value and has about one-seventh the heat storage capacity of fire brick walls of equal heat flow. In 100-pound bags. **Cwt.** **$8.50**

333M5 Insulag. A superior refractory lagging with unsurpassed insulating properties for use on high- or low-temperature equipment. Used for operating temperatures at which other laggings fail. Has low heat storage and low thermo-conductivity. Insulag expands and increases in thickness after application, retaining this increased volume. Recommended for interface temperatures up to 2200° F., or direct exposed to 2000° F. On the average 3 pounds of Insulag covers 1 square foot to a thickness of 1 inch. Can be troweled to a smooth hard finish. 75-pound bags. **Cwt.** **$7.50**

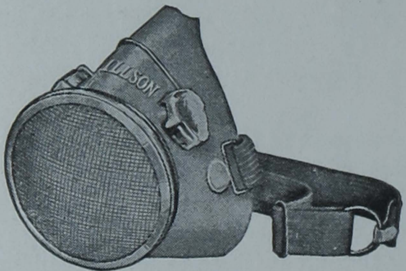
333M6 Refractory Guns, Quigley. For quick furnace repairs, hot patching, protective surfacing, baffle construction and maintenance. Consists of a cast iron machined cylinder from which the material is forced by pressure applied to the piston. Pre-mixed material, such as Hytempite and ganister, is put in the gun through a charging opening in the top. The door is sealed by a quick acting cover, secured by screw clamps. The gun is mounted on three wheels and can be moved easily around the plant. Locking device anchors the gun when handle is erect. Gun is 3¾ feet high from floor to top of cylinder. It has a capacity of 2 cubic feet of mixed refractory material. This charge will cover 100 square feet with a coat ¼ inch thick. Compressed air is used to operate the gun. Pressure used should be 70 to 90 pounds for best results. Work has been done at 50 pounds with thin mixtures. The higher pressures are generally used for plastic Hytempite mixtures. Pressure is applied to the bottom of the piston through piping controlled by valve B. As the piston rises, the mixture is forced into the Y-connection "C" from which point it is carried through the hose by the combined pressure of the piston and pressure through the control nozzle. A drain plug "G", just above the piston, and a quick opening cock, for releasing the pressure under the piston at "H", are provided. Complete with valves and cocks, safety valve and pressure gauge, twenty feet of 1-inch hose with nozzle, and suitable funnel for filling. Shipping weight crated, 600 pounds. Price on application.

Respirators


334M1

334M1 Respirators, Automatic, Rubber. Furnished complete with head-band and sponge. **Each**..............**$1.00**

334M2 Respirator Sponges. For 334M1. **Each**......**$ .20**



334M3

334M3 Respirators, Dustite. Durable and light weight. Recommended for dusts not classified as injurious or silicosis-producing. The molded rubber face-piece conforms comfortably to the face, and a close fit around the nose is assured by an adjustable spring clip. Equipped with exhaust valves and using replaceable cotton lintine filter discs. Can be cleaned and sterilized and parts replaced readily without the use of tools. Complete with supply of filter discs. **Each**...**$1.50**

334M4 Filter Discs, Lintine. For 334M3. **Box** of 100. **$ .75**

334M5 Respirators, Dustite. Same as 334M3, except uses moistened sponge rather than a filter disc. Recommended for use only on very hot operations. Complete with sponge. **Each**...**$1.80**

334M6 Respirator Sponges. For 334M5. **Each**.....**$ .15**

Dustite Respirator Accessories

334M7 Rubber Face-piece. Each..................**$ .96**

334M8 Two-piece Single Head-band. ¾ inch. **Each** **$ .18**

334M9 Exhalation Valve Rubber Disc. Each......**$ .01**

334M10 Exhalation Valve Cover. Each............**$ .03**

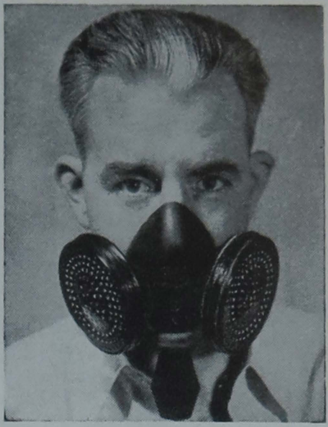
334M11 Metal Screw Ring. Male. **Each**............**$ .15**

334M12 Metal Screw Cap. Female. **Each**..........**$ .15**

334M13 Bound Screen. Each......................**$ .08**

334M14 Mask Adjusting Wire. Each.............**$ .03**

334M15 Cotton Facelets. To prevent face irritation from continuous use of respirator and in hot operations. **Box** of 12...**$ .60**


334M16

334M16 Respirators, M. S. A., Comfo, Dust and Mist. U. S. Bureau of Mines Approval No. 2101 for protection against the inhalation of silicosis producing or nuisance dusts. Has twin side-placed filters with large filtering area. Filtering medium consists of a cellulose filter and a felt screen which are replaceable.

Position of filters and head straps allows wearing of spectacles, goggles or welding helmets. Soft, flexible, inturned edge of face-piece assures a comfortable fit and airtight seal. Very light in weight.

Aluminum filter cases and rubber face-piece may be washed and disinfected without risk of corroding metal. Complete with 10 extra filters. **Each**.........................**$2.25**

334M17 Filter Discs, Cellulose, Dust and Mist. For 334M16. **Package** of 10...........................**$ .25**

334M18 Respirators, M. S. A. Comfo Lead Dust. U. S. Bureau of Mines Approval 2107 for protection against the inhalation of mechanically generated dusts whose main harmful constituent is lead. Not approved for protection against inhalation of lead fumes. Same as 334M16, except equipped with lead dust filter discs. Complete with 10 extra filters. **Each**...**$2.25**

334M19 Filter Discs, Cellulose, Lead Dust. For 334M18. **Package** of 10....................................**$ .25**

334M20 Felt Screens. Package of 10..............**$ .35**

334M21 Inhalation Valve Set. Increases efficiency of Comfo respirator but not furnished as standard equipment. **Set**...**$ .30**

334M22 Elastic Head-bands. Set.................**$ .20**

334M23 Exhalation Valve. Rubber. **Each**.........**$ .50**

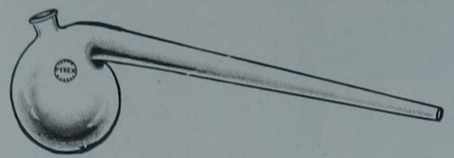
334M24 Facelets. Cotton knitted. **Each**............**$ .06**

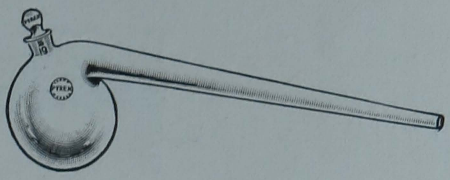
334M25 Perforated Lids. Each....................**$ .15**

334M26

334M26 Respirator Hoods, Acid-Proof. With sponge-filter respirator. Made of acid-proof cloth. Lookouts are of celluloid. Respirator is held in place by a strap with sliding buckle outside the hood. Used for acid fumes and dust where a face, head and neck covering is required. Not recommended for ammonia or poisonous fumes. **Each**.................**$6.00**

Retorts


335M1


335M3

335M1 Retorts, Tubulated, Pyrex. Suitable for use with rubber stoppers. These retorts are strong mechanically and are highly resistant to thermal breakage.

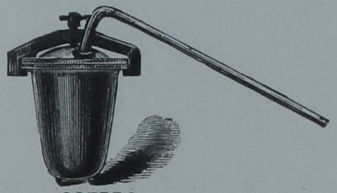
Capacity, ml.	**125**	**250**	**275**	**500**	**1000**	**2000**	**6000**	**12000**
Stopper number	0	2	2	3	4	4	8	8
Quantity in case	18	12	12	12	6	6	4	2
Each	**$ .90**	**1.05**	**1.20**	**1.80**	**2.70**	**4.20**	**6.40**	**10.00**
Case	**$14.58**	**11.34**	**12.96**	**19.44**	**14.58**	**22.68**	**23.04**	**18.00**

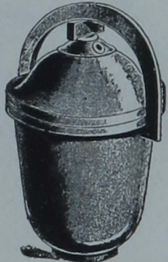
335M2 Retorts, Glass Stoppered.

Capacity, ml.	**125**	**250**	**500**
Quantity in case	36	24	24
Each	**$1.20**	**1.30**	**1.40**

335M3 Retorts, Glass Stoppered, Pyrex. With penny head Ŧ glass stoppers.

Capacity, ml.	**125**	**250**	**275**	**500**	**1000**	**2000**	**6000**	**12000**
Stopper Ŧ number	13	16	16	19	22	27	38	38
Quantity in case	18	12	12	12	6	6	4	2
Each	**$ 1.35**	**1.55**	**1.80**	**2.40**	**3.60**	**5.60**	**8.00**	**12.00**
Case	**$21.87**	**16.74**	**19.44**	**25.92**	**19.44**	**30.24**	**28.80**	**21.60**


335M4


335M5

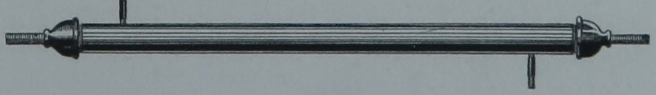
335M4 Retorts, Iron. Ground on the inside and with covers ground-in. Complete with iron delivery pipe.

Capacity, pints	**½**	**1**	**2**	**4**	**8**	**16**
Diameter, inches	2¾	3½	4⅛	5⅛	7¼	9¾
Size, pipe, inches	⅛	¼	¼	¼	⅜	½
Weight, pounds	5	7	10	17	24	40
Each	**$4.05**	**4.50**	**4.95**	**6.30**	**9.00**	**10.80**

335M5 Retorts, Iron, Nevada Pattern. Oval top, ground-in cover; complete with iron delivery pipe.

Capacity, pints	**3**	**4**	**5**	**6**	**10**	**36**
Capacity, pounds, quicksilver	38	50	63	75	125	350
Weight, pounds	18	25	30	44	65	145
Each	**$8.50**	**9.00**	**11.00**	**14.00**	**16.00**	**40.00**

Note: Above retorts furnished with threaded delivery pipe and coupling, for connection to retort condenser. **Extra**...... **$ .50**


335M6

335M6 Retort Condensers. For attachment to the delivery tube of quicksilver retorts to condense the vapor by means of a constant stream of cooling water passed through the condenser water jacket. Body 30 inches long and 1½ inches in diameter, with ⅜-inch I. P. T. (iron pipe thread) threaded pipe connections at each end and ⅛-inch pipe water connections. Made of steel pipe.
Each.. **$4.00**

Rheostats

336M1

Rheostats. Supplied with tubes of solid wall porcelain, glazed inside and outside.

The resistance element has the same coefficient of expansion as the tubes, hence there are no loose turns at any time. Between substantial end supports, which can be fastened to table or wall, a heavy brass rod is fastened. A sliding contact brush is made up of a number of segments of phosphor bronze, tempered, over which is mounted a piece of slightly heavier gauge material to maintain the proper tension. These contacts are very carefully ground and finished by hand so as to insure minimum wear on the resistance element and a smooth and positive contact without cutting. These slider contacts are moved readily from end to end on the tube, thus giving as many steps of resistance as there are turns of the wire or ribbon.

336M1 Rheostats. Twenty-inch. Dimensions of tube: length, 20 inches; diameter, outside, 2½ inches (500 mm. x 63 mm.).

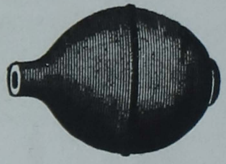
Type	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	***2009**	***2010**	***2011**	***2012**
Current, amperes	0.3	0.4	0.6	1.0	1.2	1.5	2.0	2.8	3.3	5.0	6.5	8.5	12.0
Resistance, ohms	6400	3500	1800	1200	750	425	220	140	100	45	28	16	8
Each	**$14.00**	**14.00**	**14.00**	**14.00**	**14.00**	**14.00**	**14.00**	**14.00**	**14.00**	**14.00**	**14.00**	**14.00**	**14.00**

336M2 Rheostats. Sixteen inch. Dimensions of tube: length, 16 inches; outside diameter, 1⅝ inches (400 mm. x 40 mm.).

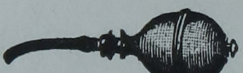
Type	**1600**	**1601**	**1602**	**1603**	**1604**	**1605**	**1606**	**1607**	**1608**	***1609**	***1610**	***1611**	***1612**
Current, amperes	.3	.4	.6	1	1.2	1.5	2	2.8	3.3	5	6.5	8.5	12
Resistance, ohms	3200	1700	920	600	370	210	110	70	50	23	14	8	4
Each	**$8.00**	**8.00**	**8.00**	**8.00**	**8.00**	**8.00**	**8.00**	**8.00**	**8.00**	**8.00**	**8.00**	**8.00**	**8.00**

*Wound with ribbon.

Rubber Goods

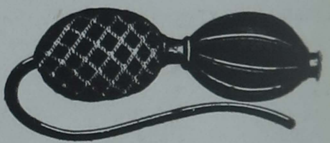


336M3



336M4

336M6



336M7

336M3 Rubber Bulbs. Without valve. For pipettes, droppers, etc.

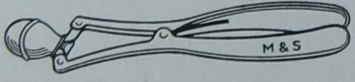
Capacity, ml.	**2**	**5**	**10**	**25**	**50**	**100**
Diameter, inches	½	1¹⁄₁₆	1¼	1½	1¹³⁄₁₆	2
Length, inches	1½	1¾	2⅜	2¾	3¼	4
Each	**$ .02**	**.07**	**.15**	**.20**	**.25**	**.30**

336M4 Rubber Bulbs. With valves and 6 inches rubber tubing. Capacity, 50 ml. **Each** .... **$ .30**

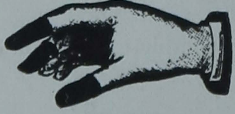
336M5 Rubber Bulbs. Same as 336M4, except with hard rubber valve for bromine wash bottles. **Each** .... **$ .40**

336M6 Rubber Bulbs, Double Acting. Capacity, 3 ounces. Equipped with valves at each end to which tubing may be attached. Bulb is 4½x2¹⁄₁₆ inches. **Each** .... **$ .45**

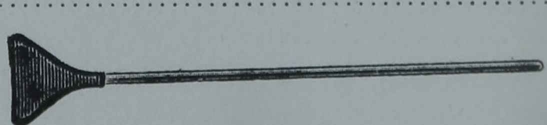
336M7 Rubber Bulbs, Constant Pressure. Bulb is pure gum with inlet and outlet valves. Rubber expansion bag protected with net. **Each** **$1.50**



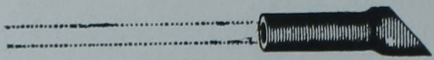
336M8



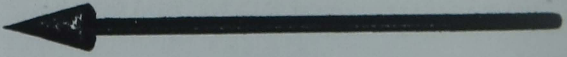
336M9



336M11



336M10



336M12

336M8 Rubber Bulb Expanders. For stretching the opening of rubber bulbs and tubing to facilitate making connections. Made of stamped steel. **Each** .... **$ .75**

336M9 Rubber Finger Cots.

Size	Small	Medium	Large
Dozen	**$ .25**	**.25**	**.25**

336M10 Rubber Stirrers, Blair. Dimensions: 1⅜ inches long; ³⁄₁₆-inch bore; ⁷⁄₁₆-inch skived end. Tip only; without rod. **Dozen** .... **$.50**

336M11 Rubber Stirrers, Wing Shape, Policemen. To be attached to glass rod; for scraping precipitates from walls or beakers. Without rod. **Dozen** .... **.80**

336M12 Rubber Stirrers. Cone Point, complete with rod. Consists of a soft pure rubber cone 20 mm. in length removably attached to a hard rubber rod 150 mm. in length, and 5 mm. in diameter. **Each** .... **$ .25**

336M13 Rubber Stirrer Cones, Only. Each .... **$ .10**

Rubber Sheeting

337M1 Rubber Sheeting, White. Rubberized one side only. 36 inches wide. **Yard**........ **$1.25**

337M2 Rubber Sheeting, Black. Rubberized one side only. 36 inches wide. **Yard**........ **$1.25**

337M3 Rubber Sheeting, Black. Rubberized on both sides. 36 inches wide. **Yard**........ **$1.50**

337M4 Rubber Sheeting (Rubber Dam). Pure gum, steam cured rubber. Weight approximately 5 ounces per square yard. **Square foot, $ .30. Square yard**........ **$1.50**

Rubber Stoppers

337M5 Solid

337M6 One Hole

337M7 Two Hole

Rubber Stoppers. Made of black non-blooming rubber compound. Specific gravity, 1.25. All stoppers are 1 inch (25 mm.) long.

Size	**00**	**0**	**1**	**2**	**3**	**4**	**5**
Diameter, top, inches	9/16	5/8	23/32	13/16	57/64	63/64	1 3/64
Diameter, bottom, inches	3/8	1/2	9/16	5/8	23/32	25/32	57/64
Size, holes, inches	1/8	1/8	5/32	5/32	3/16	3/16	7/32
Quantity in pound, approx., solid	130	87	60	57	42	34	28
Quantity in pound, approx., one-hole	138	91	64	59	44	36	29
Quantity in pound, approx., two-hole	152	96	67	61	46	38	30

Size, continued	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
Diameter, top, inches	1 1/4	1 7/16	1 9/16	1 23/32	1 15/16	2 3/16	2 9/16	2 3/4
Diameter, bottom, inches	1 1/32	1 3/16	1 9/32	1 11/32	1 5/8	2	2 9/32	2 3/8
Size, holes, inches	7/32	7/32	7/32	7/32	7/32	1/4	1/4	1/4
Quantity in pound, approx., solid	20	16	12	10	8	6	5	4
Quantity in pound, approx., one-hole	21	17	13	11	8	6	5	4
Quantity in pound, approx., two-hole	22	18	14	12	8	6	5	4

337M5 Rubber Stoppers, Solid. Pound........ **$ .90**

337M6 Rubber Stoppers, One-Hole. Pound........ **$ .90**

337M7 Rubber Stoppers, Two-Hole. Pound........ **$ .90**

Rubber Stoppers, Amber. Made of pure crepe gum floating stock. Non-blooming and heat resisting. Specific gravity, .98. All stoppers are 1 inch (25 mm.) long.

Size	**00**	**0**	**1**	**2**	**3**	**4**	**5**	**6**
Diameter, top, mm.	14	16	18	20	23	25	27	32
Diameter, bottom, mm.	10	12	14	16	18	20	23	26
Quantity in pound, approx., solid	190	106	78	73	55	45	36	28
Quantity in pound, approx., one-hole	213	114	82	76	57	47	38	30
Quantity in pound, approx., two-hole	232	123	86	80	60	49	40	32

Size, continued	**7**	**8**	**9**	**10**	**11**	**12**	**13**
Diameter, top, mm.	36	40	45	50	56	65	70
Diameter, bottom, mm.	30	33	37	42	48	58	60
Quantity in pound, approx., solid	21	16	13	11	7	6	5
Quantity in pound, approx., one-hole	22	17	14	12	8	6	5
Quantity in pound, approx., two-hole	23	18	15	13	9	6	5

337M8 Rubber Stoppers, Solid. Pound........ **$1.00**

337M9 Rubber Stoppers, One-Hole. Pound........ **$1.00**

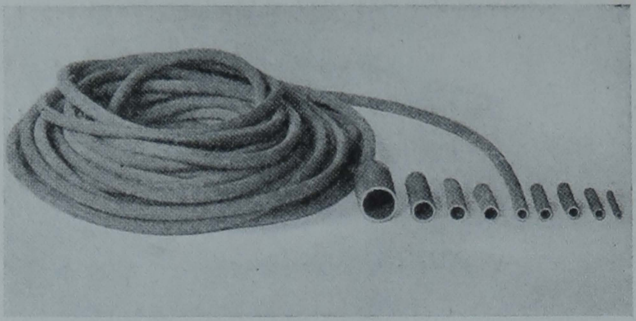
337M10 Rubber Stoppers, Two-Hole. Pound........ **$1.00**

337M11 Rubber Stoppers, Solid. For Kjeldahl flasks.

For flasks, capacity, ml.	**500**	**800**
Diameter, top, mm.	32	39
Diameter, bottom, mm.	26	28
Length, mm.	34	55
Each	**$ .10**	**.15**

337M12 Rubber Stoppers, One-Hole. For Kjeldahl flasks, otherwise same as 337M11. **Each**........ **$ .10** **.15**

Rubber Tubing



338M1

338M1 Rubber Tubing, Black, "Pure Gum," Massco Brand, Light Wall. Hand wrapped, cloth impression finish. A high grade floating stock laboratory tubing of low sulphur content, very elastic and pliable.

Inside diameter, inches	1/8	5/32	3/16	1/4	5/16	3/8	1/2
Wall thickness, inches	1/32	3/64	3/64	3/64	1/16	5/64	3/32
Foot	$ .07	.08	.08	.09	.11	.14	.16

338M2 Rubber Tubing, Black, "Pure Gum," Massco Brand, Heavy Wall. Same as 338M1, except not as pliable due to the heavier wall.

Inside diameter, inches	1/8	5/32	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1
Wall thickness, inches	1/16	1/16	5/64	5/64	3/32	3/32	1/8	1/8	1/8	1/8
Foot	$ .08	.09	.09	.12	.15	.16	.18	.22	.25	.30

338M3 Rubber Tubing Black, "Pure Gum," Extra Heavy Wall. Same as 338M1, except with very heavy wall for more severe use.

Inside diameter, inches	1/8	1/4	3/8	1/2
Wall thickness, inches	1/8	1/8	3/16	3/16
Foot	$ .14	.18	.28	.35

338M4 Rubber Tubing, Black, Pressure and Vacuum. Hand wrapped cloth impression finish. A firm, dense tubing for medium vacuum and pressure application.

Inside diameter, inches	3/16	1/4	5/16	3/8
Wall thickness, inches	3/16	3/16	1/4	1/4
Foot	$ .15	.20	.30	.40

338M5 Rubber Tubing, White, Massco Brand, Light Wall. Hand wrapped, cloth impression finish. A firm walled durable laboratory tubing, low in sulphur content and non-blooming. Excellent for burner connections.

Inside diameter, inches	1/8	3/16	1/4	5/16	3/8	1/2
Wall thickness, inches	1/16	1/16	1/16	1/16	3/32	3/32
Foot	$ .05	.06	.07	.08	.10	.16

338M6 Rubber Tubing, White, Massco Brand, Heavy Wall. Same as 338M5, except heavier wall. Excellent for low vacuum and pressure, air and water connections.

Inside diameter, inches	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1
Wall thickness, inches	3/32	3/32	1/8	1/8	1/8	1/8	1/8	1/8	1/8
Foot	$ .08	.09	.11	.12	.15	.16	.25	.30	.40

338M7 Rubber Tubing, Red, Medium Wall. A high quality antimony tubing for laboratory use. Elastic and pliable.

Inside diameter, inches	1/8	3/16	1/4	5/16	3/8	1/2
Wall thickness, inches	1/32	1/16	1/16	3/32	3/32	1/8
Foot	$ .06	.08	.10	.14	.15	.20

338M8 Rubber Tubing, Red, 4 Ply, Cloth Insertion, High Pressure. The rubber in this tubing is compounded with antioxidants to insure long service without hardening, and the cloth insertion is of the best quality cotton duck.

Inside diameter, inches	3/16	1/4	5/16	3/8	7/16
Wall thickness, inches	7/32	7/32	7/32	7/32	7/32
Working pressure, pounds per square inch	250	250	250	170	170
Foot	$ .15	.16	.18	.20	.25

338M9 Rubber Tubing, Black, Neoprene. A flexible and elastic tubing made of synthetic rubber. Exceptionally resistant to gasoline or oils and the effect of oxidation by oxygen or ozone, but does not resist the solvent action of benzene, xylol and other cyclic or chlorinated hydrocarbons.

Inside diameter, inches	3/16	1/4
Wall thickness, inches	1/16	3/32
Foot	$ .15	.23

338M10 Rubber Tubing, Amber, Medium Wall. Hand wrapped, cloth impression finish. A high quality, floating stock tubing, low in sulphur content and non-blooming. Elastic and pliable.

Inside diameter, inches	1/8	3/16	1/4	5/16	3/8	1/2
Wall thickness, inches	3/64	1/16	1/16	5/64	5/64	3/32
Foot	$ .07	.09	.11	.14	.16	.18

338M11 Rubber Tubing, Transparent, Medium Wall. A hand made pure gum tubing, acid cured and sulphur free. Highly elastic and bore has a glossy clinging finish for glass connections.

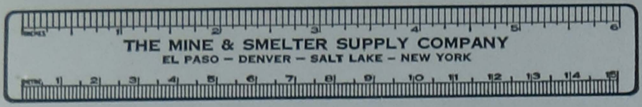
Inside diameter, inches	1/8	5/32	3/16	1/4	5/16
Wall thickness, inches	1/16	5/64	5/64	3/32	3/32
Foot	$ .12	.15	.18	.20	.25

338M12 Rubber Tubing, Black, Gooch. Best quality, very elastic.

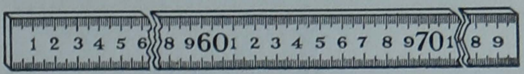
Width, when flat, inches	1¼	1½	1¾
Foot	$ .15	.20	.25

Note: For blood pipette tubing, see page 93.

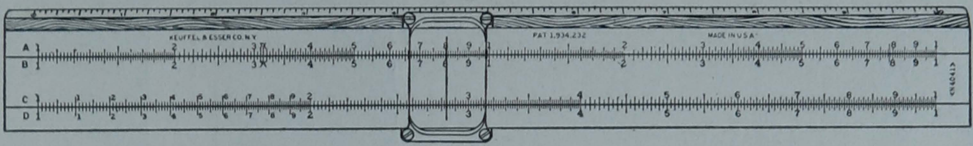
Rules


THE MINE & SMELTER SUPPLY COMPANY
EL PASO – DENVER – SALT LAKE – NEW YORK

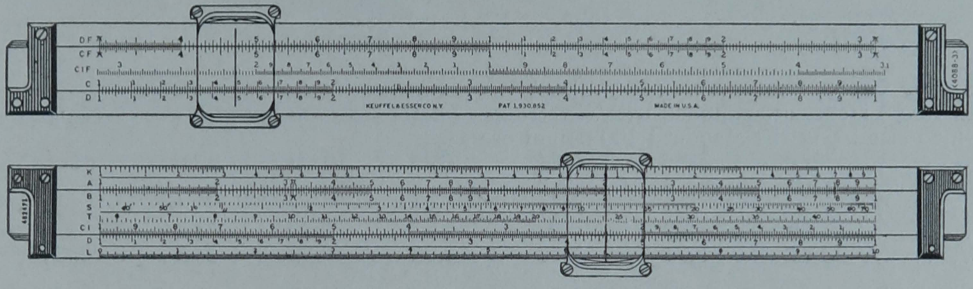
339M1



339M3



339M6



339M8

339M1 Rules, Celluloid. 6 inches and 150 mm. Centigrade and Fahrenheit scale on reverse side with a number of metric and English equivalents. **Each** .... **$ .10**

339M2 Rules, Metric. Maple, 12 inches long. Graduated in both English and Metric systems. Double bevel. **Each** .. **$ .10**

339M3 Rules, Meter Sticks, Maple. One side divided in decimeters, centimeters and millimeters; other side, in inches and eighths. **Each** .... **$ .30**

339M4 Rules, Meter Sticks. Same as 339M3, except is brass tipped. **Each** .... **$ .45**

339M5 Rules, Slide, Beginners', Manheim. 10 inches long, with divisions printed on light colored wood and with frameless glass indicator. In fibre case, with directions. **Each** .... **$ .75**

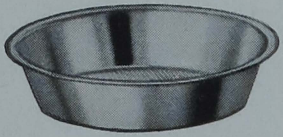
339M6 Rules, Slide, Manheim. 10-inch, adjustable. Engine divided. Divisions on white facings with glass indicator secured in nickel-plated metal frame. In fiber case, with directions. **Each** **$6.20**

339M7 Rules, Slide, Manheim. Same as 339M6, except with sewed leather case. **Each** **$7.00**

339M8 Rules, Slide, Polyphase Duplex. 10-inch adjustable. Engine divided. Divisions on white facings with glass indicator secured in nickel-plated metal frame. In fiber case with directions. **Each** **$9.50**

339M9 Rules, Slide, Polyphase Duplex. Same as 339M8, except with sewed leather case. **Each** **$10.50**

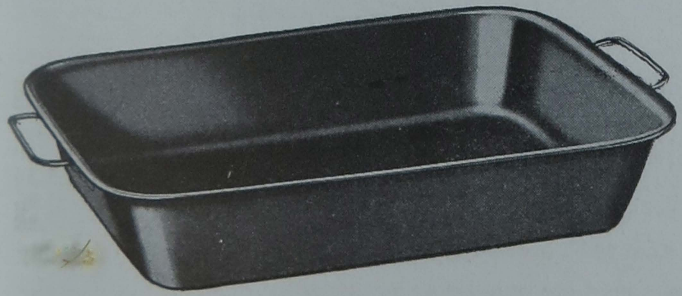
Sampling Equipment



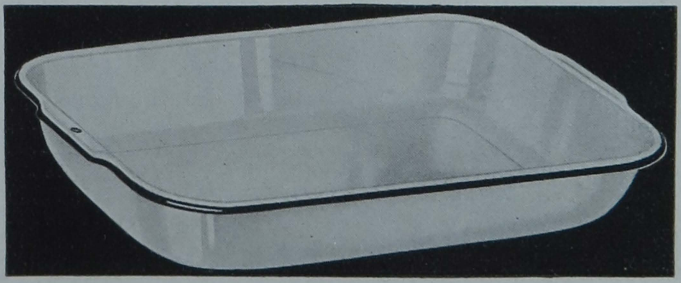
339M10

339M10 Sample Pans, Round. Seamless, tinned pans with flat rim and beaded edge.

Diameter, inches	**5⅜**	**6⅛**	**6 15/16**	**8 9/16**	**10⅝**
Depth, inches	1 3/16	1⅜	1 7/16	1¾	2⅛
Capacity, quarts	⅜	½	¾	1¼	2½
Dozen	**$ .80**	**.85**	**.90**	**1.15**	**1.25**



339M11



339M12

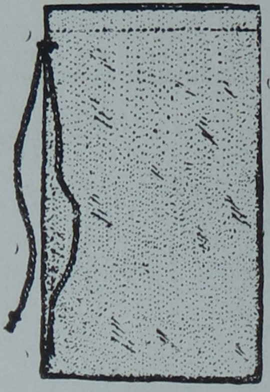
339M11 Sample Pans, Oblong. Black steel; seamless; with rounded corners and drop handles.

Dimensions, inches	**10x8**	**12x9**	**14x10**
Depth, inches	2	2	2½
Dozen	**$1.75**	**2.15**	**2.60**

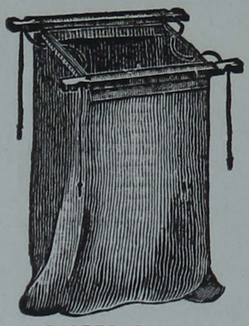
339M12 Sample Pans, Oblong. White enamel; seamless; with extended edge handles.

Dimensions, inches	**8¾x12¼**	**9½x14⅜**	**10¾x15½**
Depth, inches	2⅜	2½	2½
Each	**$ .50**	**.60**	**.75**

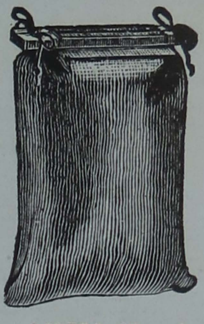
Sampling Equipment, Continued



340M1



340M2 Open



340M2 Closed

340M1 Sample Bags, Ore Sacks, Canvas. Made of closely woven canvas duck. For sampling, storing and shipping ore concentrates, etc. Sizes to 12x16 inches are supplied with tie strings. Larger sizes are known as ore sacks and are supplied without tie strings, the 17x24-inch size being the standard 100-pound ore sack.

Size, inches	**4x7**	**6x10**	**7x14**	**9x15**	**10x21**	**12x16**	**14x24**	**17x24**	**18½x28**
Weight of canvas, ounces	8	8	8	8	8	8	12	12	12
Each	**$ .05**	**.06**	**.09**	**.11**	**.14**	**.17**	**.24**	**.30**	**.34**
Dozen	**$ .50**	**.63**	**.96**	**1.17**	**1.50**	**1.80**	**2.65**	**3.30**	**3.70**
Hundred	**$3.75**	**4.75**	**7.25**	**8.75**	**11.25**	**13.75**	**20.00**	**24.75**	**28.50**

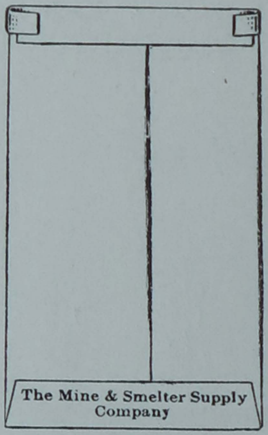
340M2 Sample Bags, Ore Sacks, Boss Fastener. Made from 12-ounce canvas duck, with hard wood strips fastened to bag to facilitate filling and tieing.

Size, inches	14x24	17x24	18½x28
Each	**$ .48**	**.50**	**.60**

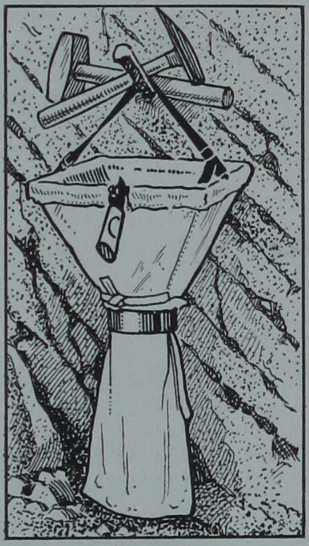
Note: All of the above bags can be supplied with stencil imprint. **Extra,** per hundred, **$1.50.**

340M3 Sample Bags, Paper. Light Kraft paper bags for inexpensive storing of samples. 500 bags per bundle.

Trade capacity, lbs.	½	**1**	**2**	**3**	**4**	**5**	**10**	**16**	**20**	**25**
Length, inches	6¼	7½	8½	9	10	10¾	13½	16½	16¼	18½
Width, inches	3	3½	4½	4¾	5	5½	6½	7¾	8¼	8¼
Bundle of 500	**$ .40**	**.45**	**.50**	**.60**	**.70**	**.90**	**1.35**	**2.00**	**2.25**	**2.50**


The Mine & Smelter Supply Company

340M4



340M6

340M4 Sample Mailing Envelopes. Made of strong paper. With metal sealing clasp.

Size, inches	**3x5**	**3½x6**	**4x7**	**4½x8**	**5x9**
Size, ounces	1	2	4	6	8
Weight, shipping, pounds, per thousand	10	16	20	25	30
Hundred	**$ .80**	**.90**	**1.00**	**1.10**	**1.20**
Five Hundred	**$3.50**	**4.00**	**4.13**	**4.50**	**4.63**
Thousand	**$6.75**	**7.75**	**8.00**	**8.75**	**9.00**

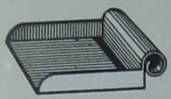
Note: Furnished without imprint on special order. No additional charge when ordered in lots of 1000 or more of a size.

340M5 Sample Mailing Envelopes, Excelsior. For mailing finely ground ore samples or powdered substances. The envelope is sealed tight when folded and gummed. Size, 3½ by 5 inches. **Hundred, $ .80. Thousand** **$7.50**

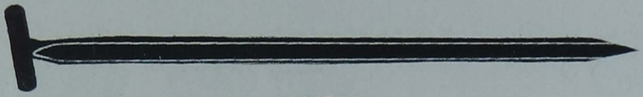
340M6 Sample Catchers, Wilfley. Permits uniform sampling with no losses. Samples are dropped through canvas funnel into sample bag which is suspended by ring clamp. May be carried from shoulder leaving hands free. Useful in dangerous or awkward positions and readily carried when climbing. Opening, 10x16 inches. Weight, 3 pounds. **Each** **$5.00**

340M7 Canvas Replacement, Only. Each **$2.25**

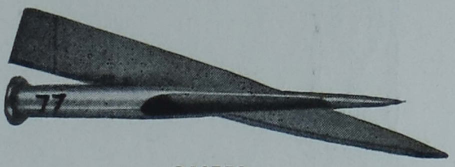
Sampling Equipment, Continued



341M1



341M2



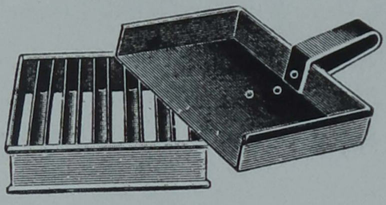
341M3

341M1 Sampling Scoops. For sampling and amalgamating. Made of sheet iron, 5x6½ inches. **Each** .... **$ .60**

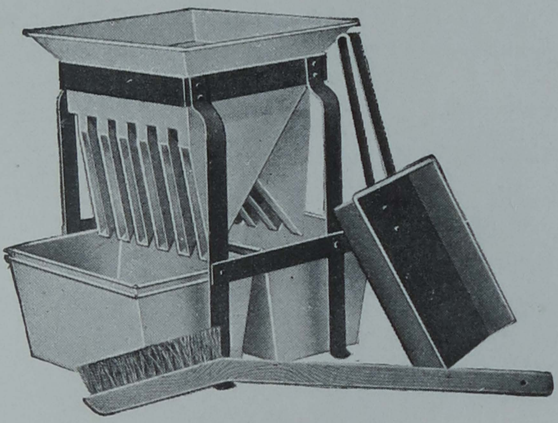
341M2 Samplers, Concentrate or Cement. Sampler with tee handle for sampling concentrates or sand. Length, 36 inches · **Each** **$6.00**

341M3 Samplers, Bag Triers. 6 inches long, with leather shield. **Each** **$1.25**

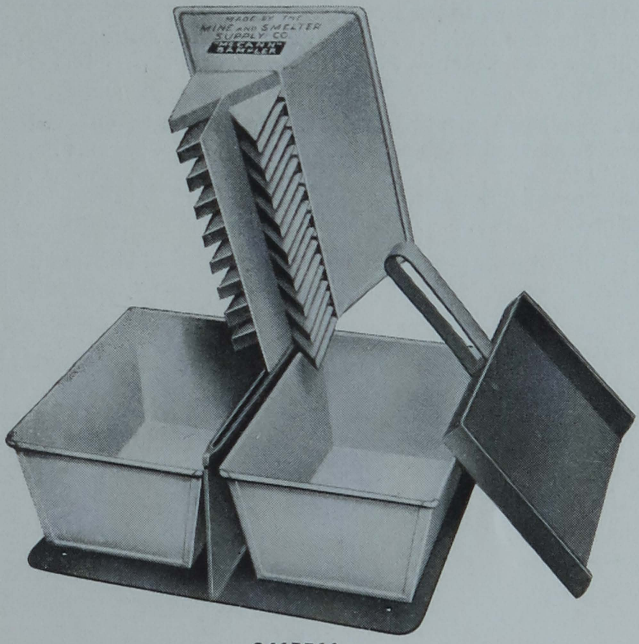
341M4 Samplers, Bag Triers. 9 inches long, with leather shield. **Each** **$2.25**



341M5



341M8



341M11

341M5 Samplers, Ore. Sampler made of tinned iron; scoop made of sheet iron with band iron handle. With scoop.

Dimensions, inches	**6x6**	**9x9**	**12x12**
Width, trough, inches	½	½	¾
Complete	**$3.50**	**5.00**	**7.00**
341M6 Sampler, Only. Each	**$2.25**	**3.50**	**5.25**
341M7 Scoop, Only. Each	**$1.25**	**1.50**	**1.75**

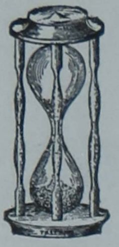
341M8 Samplers, Ore, Jones. Made of heavy gauge tinned sheet metal and band iron. Its construction facilitates quick and even sampling. It consists of hopper set in four-legged support, scoop, four sampling pans and brush. All parts can be cleaned easily.

Size at top of riffles, inches	**8x10**	**10x18**
Riffle width, inches	¾	1
Complete	**$22.50**	**36.00**
341M9 Pans, Only. Each	**$ 1.75**	**2.25**
341M10 Scoop, Only. Each	**$ 1.50**	**2.50**

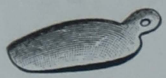
341M11 Samplers, McCann. The short, easily cleaned riffles reduce the danger of salting. The heavy metal base forms the sampler support and pan base. Complete with four pans, scoop and brush.

Size at top of hopper, inches	**4x6**	**6x10**	**8x12**
Riffle width, inches	½	¾	¾
Complete	**$12.50**	**19.50**	**22.50**
341M12 Pans, Only. Each	**$ .75**	**1.25**	**1.75**
341M13 Scoop, Only. Each	**$1.00**	**1.25**	**1.75**

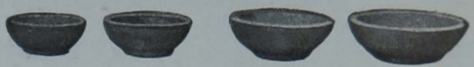
Note: Other sizes than listed or samplers with different sized riffles can be made to order. Prices on application.
Note: For brushes for samplers, see page 48.



342M1



342M2



342M3

342M1 Sand Glasses. Made of white wood with turned pillars.

Time, minutes	3	5	10
Each	**$ .45**	**.50**	**1.00**

342M2 Scoops, Horn.

Length, inches	4	5	6
Each	**$ .40**	**.50**	**.60**

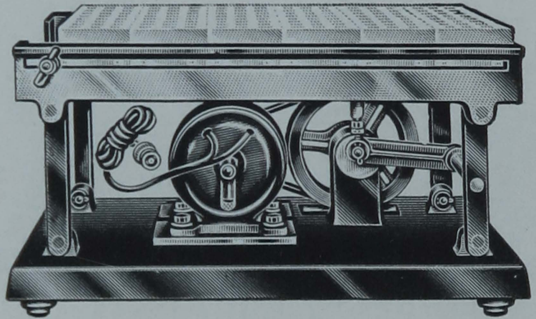
342M3 Scorifiers, Clay, Regular. Deep form. Made from a high grade Western clay. Will stand a heavy lead charge, and not liable to be attacked seriously during scorification, even with heavy copper ores.

Diameter at top, inches	**2**	**2¼**	**2½**	**3**
Quantity in case	250	250	250	160
Weight per case, pounds	33	39	48	42
Hundred	**$2.45**	**2.55**	**2.90**	**3.80**

342M4 Scorifiers, Clay, Bartlett. Shallow form. Otherwise same as 342M3.

Diameter at top, inches	**2**	**2¼**	**2½**	**3**
Quantity in case	250	250	250	160
Weight per case, pounds	33	39	48	42
Hundred	**$2.45**	**2.55**	**2.90**	**3.80**

Note: 10% discount on scorifiers when purchased in case quantities and may be assorted with cases of crucibles for larger quantity discounts.



342M5

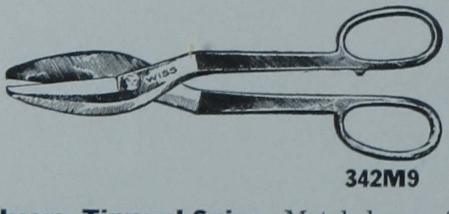
Shaking Machines, Kahn. For the Kahn test it is essential that the test tubes be subjected to a shaking operation of 275 to 285 oscillations per minute with the excursion limited to 1½ inches. This performance factor is achieved by means of a powerful electric motor actuating the rack platform through a silent, non-slip V-belt pulley drive and eccentric crank transmission. The motor is of low-speed, high-torque characteristics especially selected for laboratory service. Strength and stability are built into the assembly by the use of a heavy iron base casting having bolt holes for rigid mounting to table top or bench, and rubber pads for corner rests. Racks are held in place by means of a spring retainer easily manipulated for inserting or removing the racks.

342M5 Shaking Machines, Kahn, Six-Rack. Base size, 9x19 inches, without racks. For 110-volt, 60-cycle A. C. **Each** . . **$85.00**

342M6 Shaking Machines, Kahn, Six-Rack. Same as 342M5, except for 220-volt, 60-cycle A. C. **Each** **$85.00**

342M7 Shaking Machines, Kahn, Three-Rack. Base size, 8x14½ inches. Without racks. For 110-volt, 60-cycle A. C. **Each** **$75.00**

342M8 Shaking Machines, Kahn, Three-Rack. Same as 342M7, except for 220-volt, 60-cycle A. C. **Each** **$75.00**



342M9

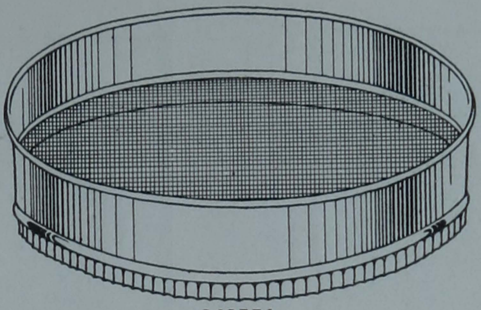
342M10

342M9 Shears, Tinners' Snips. Metal shears of fine quality. Blades are well shaped with strong point and handle, formed so they will not tire the hand. Full length, 11½ inches; length of cut, 2½ inches. **Each** **$1.25**

342M10 Shears, Trimming. Strong and heavy. For general laboratory use.

Length, overall, inches	6	8	10	12
Each	**$1.00**	**1.15**	**1.25**	**1.30**

Sieves

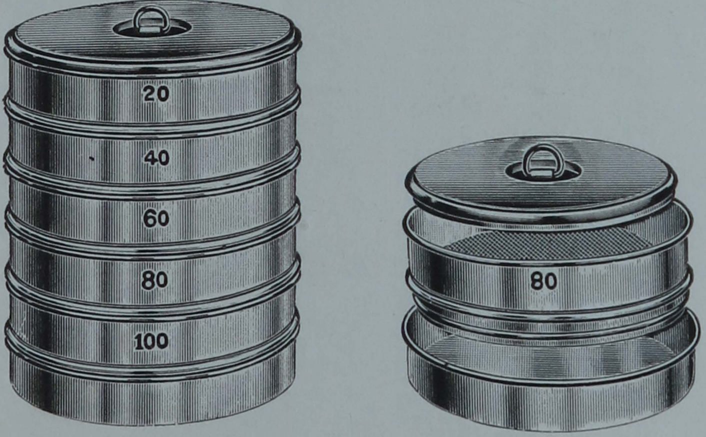


343M1

Sieves, Testing, "Tin Frame." Suitable for general purposes and metallurigcal uses where high accuracy is not required. Brass wire screen is mounted securely in substantial frames that nest well and are of sufficient depth to avoid loss of material. Dimensions: Of 8-inch diameter sieve—height, 2⅜ inches, depth to cloth, 1⅝ inches; of 12-inch diameter sieve—height, 2¾ inches, depth to cloth, 2 inches.

Mesh	**10**	**20**	**30**	**40**	**60**	**80**	**100**	**120**	**150**	**200**	**300**
Wire diameter, approx., inches	.025	.016	.0125	.010	.0075	.0055	.0045	.0037	.0026	.0021	.0015
Opening, approximate inches	.075	.034	.0198	.015	.0092	.0070	.0055	.0046	.0041	.0029	.0018
343M1 8-Inch Diam. Each	**$1.80**	**1.80**	**1.85**	**1.85**	**1.90**	**1.95**	**2.10**	**2.90**	**3.75**	**5.00**	**10.00**
343M2 12-Inch Diam. Each	**$2.50**	**2.50**	**2.75**	**2.85**	**3.00**	**3.50**	**3.75**	**4.00**	**6.50**	**9.00**	**15.00**

343M3 Covers, Only. 8-inch diameter. **Each**	**$ .85**
343M4 Pans, Only. 8-inch diameter; depth, 1¾ inches. **Each**	**$ .75**
343M5 Covers, Only. 12-inch diameter. **Each**	**$1.35**
343M6 Pans, Only. 12-inch diameter; depth, 2 inches. **Each**	**$1.25**



343M7

Sieves, Testing, Seamless Spun Brass Frame. With brass wire screen. For wet or dry sizing tests where accuracy requirements are not stringent. The size basis of these sieves is the approximate number of openings per linear inch which corresponds with the sieve number of the U. S. Bureau of Standards Series, but the accuracy is governed by wider tolerances on both sieve openings and wire diameter. Dimensions: Of 5-inch diameter sieve—height, 2 inches, depth to cloth, 1½ inches; of 8-inch diameter sieve—height, 2½ inches, depth to cloth, 2 inches; of 12-inch diameter sieve—height, 3¼ inches, depth to cloth, 2½ inches.

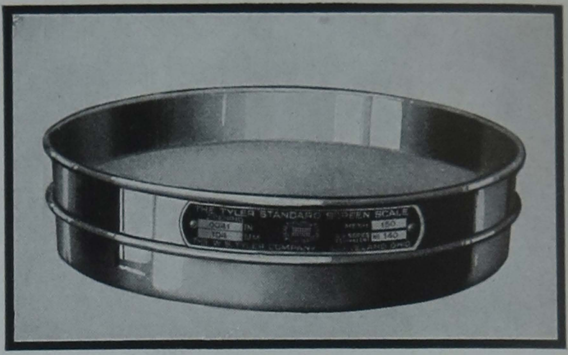
Mesh	**10**	**20**	**30**	**40**	**50**	**60**	**80**	**100**	**120**	**150**	**180**	**200**	**300**
Wire diameter, approximate inches	.030	.016	.0130	.0098	.0074	.0064	.0047	.0040	.0034	.0029	.0024	.0021	.0015
Opening, approximate inches	.079	.033	.0232	.0165	.0117	.0098	.0070	.0059	.0049	.0038	.0033	.0029	.0019
343M7 5-Inch Diameter. Each	**$2.25**	**2.25**	**2.30**	**2.40**	**2.50**	**2.65**	**2.75**	**2.95**	**3.30**	**4.20**	**4.75**	**5.25**	**9.50**
343M8 8-Inch Diameter. Each	**$3.50**	**3.50**	**3.60**	**3.75**	**3.80**	**3.95**	**4.25**	**4.50**	**5.40**	**7.00**	**7.75**	**8.50**	**19.50**
343M9 12-Inch Diameter. Each	**$6.00**	**6.00**	**6.00**	**6.25**	**7.40**	**7.60**	**7.90**	**8.25**	**8.50**	**10.75**	**12.25**	**13.75**	**32.50**

343M10 Brass Covers. 5-inch diameter. **Each**	**$1.00**
343M11 Brass Pans. 5-inch diameter; depth, 1 inch. **Each**	**$ .80**
343M12 Brass Covers. 8-inch diameter. **Each**	**$1.25**
343M13 Brass Pans. 8-inch diameter; depth, 1 inch. **Each**	**$1.05**
343M14 Brass Pans. 8-inch diameter; depth, 2 inches. **Each**	**$1.75**
343M15 Brass Covers. 12-inch diameter. **Each**	**$3.00**
343M16 Brass Pans. 12-inch diameter; depth, 1 inch. **Each**	**$2.75**
343M17 Brass Pans. 12-inch diameter; depth, 2 inches. **Each**	**$5.00**

Sieves, Continued

THE TYLER STANDARD SCREEN SCALE
OPENING
.0029 IN.
.074 MM.
MESHES TO THE INCH
200
THE W. S. TYLER COMPANY
CLEVELAND, OHIO

344M1 Full Height Sieve



344M2 Half Height Sieve

344M1 Sieves, Standard Testing, Tyler, Full Height. Meet A. S. T. M. requirements for precision testing for fineness of materials and are within the tolerances allowed by the U. S. Bureau of Standards for testing sieves. Each sieve is marked with the size of the openings in inches and millimeters, the number of mesh per inch, and the U. S. Series equivalent number if in that series. Frames are seamless brass with brass or phosphor bronze wire cloth.

The Tyler Standard Scale Series is indicated with an asterisk (*); and have as a base an opening of .0029 inch, which is the opening in 200 mesh .0021 inch wire, the standard sieve, as adopted by the U. S. Bureau of Standards. The openings increase in ratio of the square root of two, or 1.414.

For closer sizing intermediate sieves are shown, having a ratio of the fourth root of two, or 1.189.

Dimensions: 8-inch diameter sieve; height, 2⅝ inches; depth to cloth, 2 inches; 12-inch diameter sieve; height, 4¼ inches, depth to cloth, 3¼ inches. Specify diameter desired.

Mesh	U. S. Series Equivalent Number	Openings in Inches	Openings in Millimeters	Diameter of Wire Decimal of an Inch	8-Inch Diameter Each	12-Inch Diameter Each
....	....	**3**	......	.207	**$5.00**	**$11.00**
....	....	**2**	......	.192	**5.00**	**11.00**
....	....	**1½**	......	.148	**5.00**	**11.00**
....	....	**1.050***	26.67	.148	**5.00**	**11.00**
....	....	**.883**	22.43	.135	**5.00**	**11.00**
....	....	**.742***	18.85	.135	**5.00**	**11.00**
....	....	**.624**	15.85	.120	**5.00**	**11.00**
....	....	**.525***	13.33	.105	**5.00**	**11.00**
....	....	**.441**	11.20	.105	**5.00**	**11.00**
....	....	**.371***	9.423	.092	**5.00**	**11.00**
2½	....	.312	7.925	.088	**5.00**	**11.00**
3*	....	.263	6.680	.070	**5.00**	**11.00**
3½	....	.221	5.613	.065	**5.00**	**11.00**
4*	4	.185	4.699	.065	**5.00**	**11.00**
5	5	.156	3.962	.044	**4.50**	**10.50**
6*	6	.131	3.327	.036	**4,50**	**10.50**
7	7	.110	2.794	.0328	**4.50**	**10.50**
8*	8	.093	2.362	.032	**4.50**	**10.50**
9	10	.078	1.981	.033	**4.50**	**10.50**
10*	12	.065	1.651	.035	**4.50**	**10.50**
12	14	.055	1.397	.028	**4.50**	**10.50**
14*	16	.046	1.168	.025	**$4.50**	**$10.50**
16	18	.0390	.991	.0235	**4.50**	**10.50**
20*	20	.0328	.833	.0172	**4.50**	**10.50**
24	25	.0276	.701	.0141	**4.50**	**10.50**
28*	30	.0232	.589	.0125	**4.50**	**10.50**
32	35	.0195	.495	.0118	**4.50**	**10.50**
35*	40	.0164	.417	.0122	**4.50**	**10.50**
42	45	.0138	.351	.0100	**4.50**	**10.50**
48*	50	.0116	.295	.0092	**4.50**	**10.50**
60	60	.0097	.246	.0070	**4.50**	**10.50**
65*	70	.0082	.208	.0072	**4.50**	**10.50**
80	80	.0069	.175	.0056	**4.50**	**10.50**
100*	100	.0058	.147	.0042	**5.25**	**11.25**
115	120	.0049	.124	.0038	**5.50**	**11.50**
150*	140	.0041	.104	.0026	**7.25**	**14.75**
170	170	.0035	.089	.0024	**8.50**	**16.50**
200*	200	.0029	.074	.0021	**10.00**	**19.00**
250	230	.0024	.061	.0016	**18.00**	.....
270*	270	.0021	.053	.0016	**25.00**	.....
325	325	.0017	.043	.0014	**30.00**	.....
400*	...	.0015	.038	.001	**56.50**	.....

*Tyler Standard Sieve Scale, see description above.

344M2 Sieves, Standard Testing, Tyler, Half Height. Same as 344M1—identical dimensions and prices—except height of 8-inch sieve, 1⅝ inches; depth to cloth, 1 inch; and height of 12-inch sieve, 2⅝ inches; depth to cloth, 1½ inches.

When ordering, please specify mesh of sieve and diameter desired.

344M3 Brass Pan, Tyler. 8 inches in diameter. **Each** **$2.40**

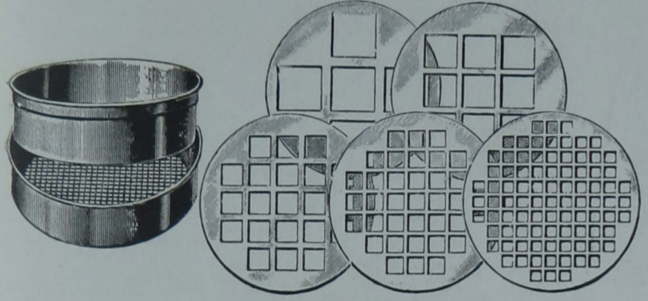
344M4 Brass Pan, Tyler. 12 inches in diameter. **Each** **$6.00**

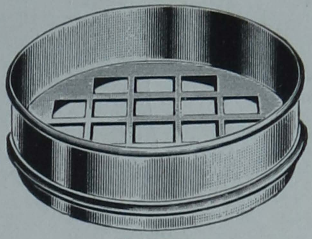
344M5 Brass Pan with Extended Rim, Tyler. Allows nesting of sieves with intermediate pans and permits two or more sieve tests to be carried out at the same time. Excellent for use with Rotap sieve shaking machine. (See page 346.) 8 inches in diameter. **Each** **$2.50**

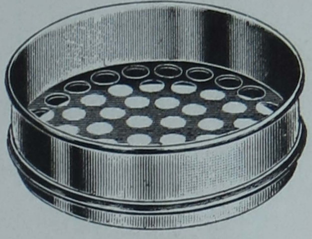
344M6 Brass Cover, Tyler. 8 inches in diameter. **Each** **$1.00**

344M7 Brass Cover, Tyler. 12 inches in diameter. **Each** **$3.00**

Sieves and Screens


345M4


345M6


345M7

Sieves and Screens, Stone Testing, Interchangeable Plate. Highway field set consists of a pair of frames 8 inches in diameter into which any one of eight plates may be inserted. The ledge of the outer frame supports the plate, while a ledge on the snug fitting inner frame holds the plate firmly. The complete set is equivalent to and serves the purpose of eight separate sieves or screens, and is substantially made to withstand rough handling.

Sieve surfaces with ¼-inch and ⅜-inch square openings are of double crimped heavy brass wire mesh. All other surfaces are heavy perforated sheet brass. All frames are spun brass of seamless one-piece construction, with rolled edges to add rigidity.

Size, plate openings, inches	¼	⅜	½	¾	1	1¼	1½	2
345M1 Sieve Plates, Only, Square Opening. Each	**$3.00**	**3.00**	**2.00**	**2.00**	**2.00**	**2.00**	**2.00**	**2.00**
345M2 Screen Plates, Only, Round Opening. Each	**$3.00**	**3.00**	**2.00**	**2.00**	**2.00**	**2.00**	**2.00**	**2.00**

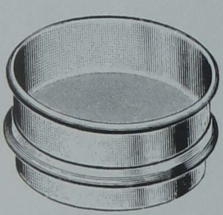
345M3 Pair of Frames, Only. Pair .... **$ 7.00**

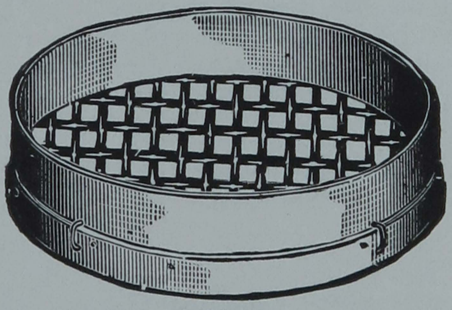
345M4 Sieve Sets, Square Opening. Consists of eight plates as listed above and pair of frames. **Set** **$23.00**

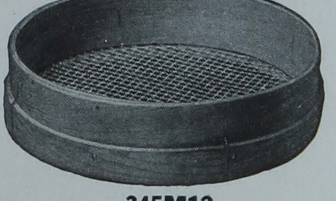
345M5 Screen Sets, Round Opening. Consists of eight plates as listed above and pair of frames. **Set** **$23.00**

Sieves and Screens, Stone Testing, Permanent Plate. Meets various A. S. T. M. requirements. Sieve surfaces with ¼-inch and ⅜-inch square openings are of double crimped heavy brass wire mesh. All other surfaces are heavy perforated sheet brass. All frames are spun brass. Frames have extended bottoms (skirts) for nesting. All are 8 inches in diameter, 2 inches deep above the perforated plate, and 2⅝ inches in overall height.

Size, openings, inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
345M6 Sieves, Square Opening. Each	**$4.50**	**4.50**	**4.50**	**4.50**	**4.50**	**4.50**	**4.50**	**4.50**	**4.50**	**4.50**
345M7 Screens, Round Opening. Each	**$4.00**	**4.00**	**4.00**	**4.00**	**4.00**	**4.00**	**4.00**	**4.00**	**4.00**	**4.00**


345M8


345M11


345M12

345M8 Sieves, Paint Testing, 325 Mesh. Meets various A. S. T. M. requirements. Used for determining the quantity of coarse particles in paint pigments. Because of its light weight this sieve may be weighed with its contents on an analytical balance. Diameter, 3 inches; depth above cloth, ⅝ inch. **Each** **$8.00**

345M9 Sieve Cover, Only. Each **$2.00**

345M10 Sieve Pan Bottom, Only. 1 inch deep. **Each** **$1.80**

345M11 Sieves, Molders Riddles. Made of galvanized steel wire with wood rims. The cloth is securely fastened to the rim to avoid sagging or pulling out. Diameter, 18 inches. Without cross wires.

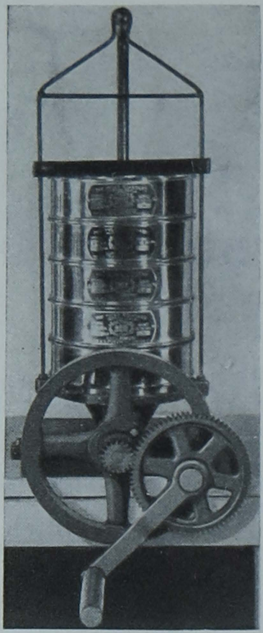
Mesh	2	4	6	8	10	12	14	16	18	20
Each	**$1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**

Note: Can be furnished with supporting cross wires or with brass wire cloth, on special order. Prices on application.

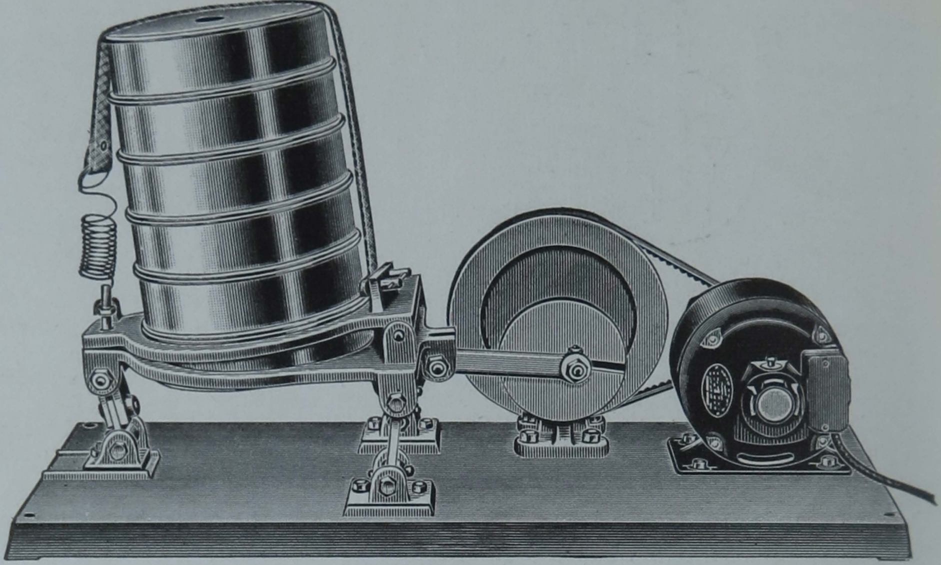
345M12 Sieves (Riddles), Tyler. Used for laboratory testing purposes. Consists of steel wire cloth with rock elm frame. The bottoms of the sieves are securely fastened so that the wire cloth does not sag. Diameter, 18 inches. Without cross wires.

Size, openings, inches	¼	⅜	½	¾	1	1½	2	2½	3	6
Each	**$5.50**	**5.50**	**5.50**	**5.50**	**5.50**	**5.50**	**5.50**	**5.50**	**5.50**	**5.50**

Sieve Shakers



346M1

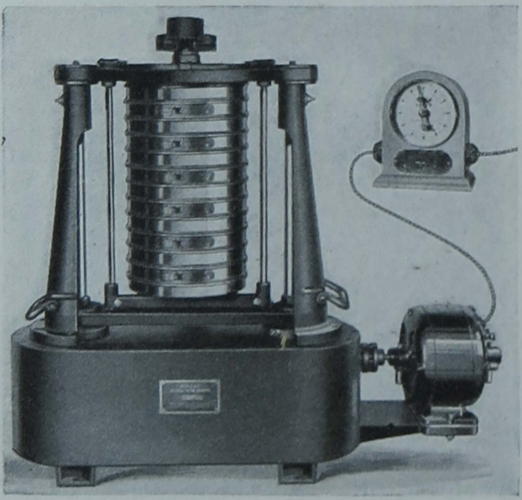


346M2

346M1 Sieve Shakers, Portable, Tyler. Hand operated, ruggedly constructed and light enough for easy handling. Designed especially for use where power is not available or where it is necessary to carry the apparatus from one place to another in making field tests. The movements of the sieves are similar to those of the hand sieve operator, but the mechanical control assures uniformity with much less labor. Particularly useful on plant mix jobs where fine aggregates and mineral fillers are used. It provides dependable sieve analysis data without the delay of sending material to a central laboratory. Used also in road stabilization work where the success of the work depends on the graduation of the sand and gravel and the percentage of clay or other binders. Capacity: One to 5 full height or 8 to 10 half height 8-inch sieves with pan and cover. Shipping weight, 50 pounds. Without sieves. **Each**. **$55.00**

346M2 Sieve Shakers, Braun-Porter. Portable, accurate, and durable. The sieves are mounted so that they tilt slightly forward, and have a rapid backward-and-forward movement. In addition, an up-and-down motion produces two distinct bumps in every cycle. The lighter of these two bumps, plus the shaking action keeps the material stirred up and throws it back and forth across the sieves, thus insuring contact of all particles with the screen surfaces. The heavier bump serves to force the material through the screen. The machine is designed to take a 1000-gram sample. Its capacity is six standard 8-inch sieves together with cover and pan. Length, 31 inches; width, 11 inches; weight, including ¼ H. P., 110-volt A. C. electric motor, 67 pounds; shipping weight, 100 pounds. Without sieves. **Each** **$115.00**

346M3 Sieve Shakers, Braun-Porter. Same as 346M2, except powered by gasoline engine for use where electricity is not available. Approximate shipping weight for complete machine, 200 pounds. **Each** **$155.00**



346M4
With Timer and Sieves

346M4 Sieve Shakers, Ro-Tap, Tyler. For handling 8-inch diameter testing sieves. Reproduces the circular and tapping motion given testing sieves in hand-sieving, but with a uniform mechanical action. With the regular height sieves, one sample can be tested on a series of six sieves of different openings, while with half-height sieves, one sample can be analyzed on a series of thirteen sieves of different openings all with one operation of the machine. By using pans with extended rims, three different samples can be tested at one time with regular height sieves, and seven different samples with half-height sieves. The machine is supplied with a ¼ H. P. electric motor for 110-volt, 60-cycle A. C. current. Speed, 1750 R. P. M. Running parts operate in oil and the machine is installed easily as no foundation is required. An automatic electric timer can be supplied to insure making tests of comparable time periods.

Dimensions: Height, 32 inches; width, 34 inches; depth, 17 inches. The net weight, including motor is 290 pounds. Approximate shipping weight, 390 pounds.

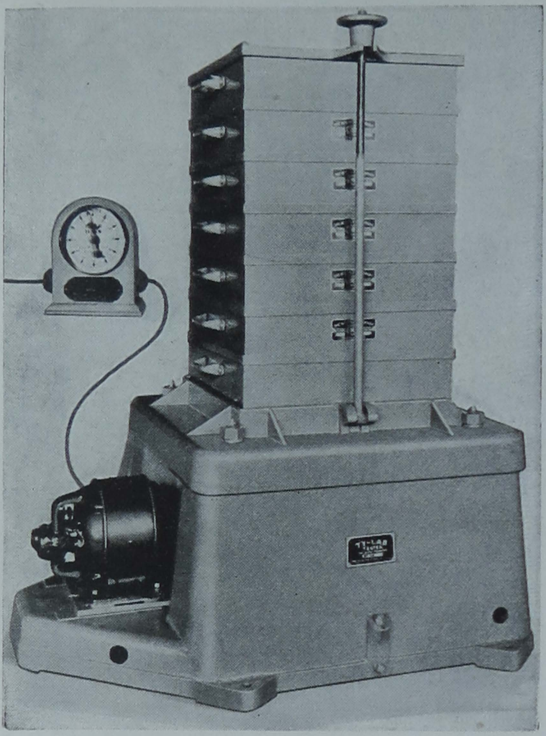
Complete, without sieves and without timer.
For 110-volt, 60-cycle A. C. current. **Each**. **$255.00**

346M5 Sieve Shakers, Ro-Tap. Same as 346M4, except for 220-volt, 60-cycle A. C. current. **Each**. **$255.00**

346M6 Timers, Tyler. For use with 346M4 and 346M5 shakers. Stops machine automatically after elapse of time set for test. **Each** **$10.00**

For Tyler 8-inch sieves, see page 344.

Sieve Testing Apparatus, Continued

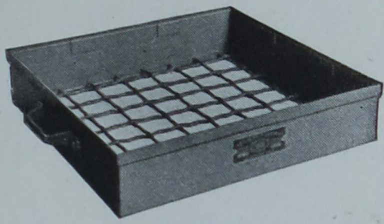


347M1 With Timer and Sieves

347M1 Sieve Shakers, Ty-Lab Tester. Designed for testing large samples of materials up to 100 pounds and as coarse as 4-inch. Handles as many as six 18x18x4-inch sieves. When large samples are tested, the sixth sieve may be replaced by a collar which makes it possible to start with a double size sample. Every move is automatically controlled and is dupicated exactly in every test. The machine is supplied with a ¾ H. P. electric motor for 220-volt, 60-cycle, 3-phase A. C. Speed, 1750 R. P. M. Overall dimensions: 33½x40½x51 inches high. Approximate shipping weight of Ty-Lab motor and switch, 1200 pounds. Complete with top plate, bottom pan and collar, but without testing sieves or timer.
Each **$475.00**

Note: The Ty-Lab tester can be supplied with motor for various current characteristics, but is not recommended for use with 110-volt lighting circuit.

347M2 Timers, Tyler. For use with 347M1. Stops machine automatically after elapse of time set for test. **Each** **$15.00**



347M3

347M3 Sieves, Ty-Lab, Tyler. For use with 347M1. With steel wire cloth. Dimensions, 18x18x4 inches.

Opening, inches....	⅜	½	¾	1	1½	2	3
Each............	**$18.50**	**18.50**	**18.50**	**18.50**	**18.50**	**18.50**	**18.50**

Note: Ty-Lab sieves with openings and mesh other than listed can be supplied on special order.

347M4 Sieve Analysis Chart Forms, Tyler, No. L1. Tabulating paper. For use in recording weights obtained when making a sieve analysis and figuring percentages from these weights. Printed on good quality bond paper. Size, 8½x11 inches. **Pad** of 50 sheets .... **$ .75**

347M5 Sieve Analysis Chart Forms, Tyler, No. L3. Tabulating paper. For entering the data of from one to six analyses made with the Tyler Standard Screen Scale "square root of 2" series. Printed on onion skin paper for blue printing. Size, 8½x11 inches. **Pad** of 25 sheets .... **$ .75**

347M6 Sieve Analysis Chart Forms, Tyler, No. L9. Tabulating paper. Similar to 347M5, but does not list the sieve specification and can be used, therefore, with any screen scale series. Printed on onion skin paper for blue printing. Size, 8½x11 inches. **Pad** of 25 sheets .... **$ .75**

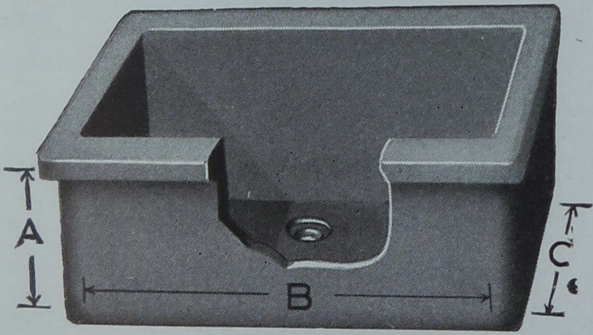
347M7 Sieve Analysis Chart Forms, Tyler, No. L4. Plotting paper. Cumulative and direct, for recording sieve tests. Rulings are spaced in the same ratio used in the Taylor Standard "square root of 2" series, and show the relationship between sizes of particles. Printed on onion skin paper for blue printing. Size, 8½x11 inches. **Pad** of 25 sheets .... **$ .75**

347M8 Sieve Analysis Chart Forms, Tyler, No. L8. Same as 347M7, except may be used also for Tyler Standard Screen Scale "fourth root of 2" series. **Pad** of 25 sheets .... **$ .75**

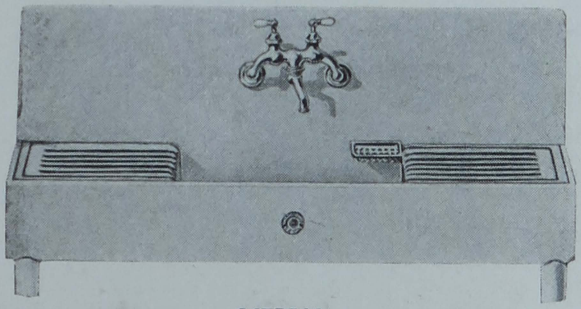
347M9 Sieve Analysis Chart Forms, Tyler, No. L5. Plotting paper. For the cumulative logarithmic plot. Printed with "inch" ruling on onion skin paper for blue printing. Size, 8½x11 inches. **Pad** of 25 sheets .... **$ .75**

347M10 Sieve Analysis Chart Forms, Tyler, No. L6. Same as 347M9, except with "millimeter" ruling. **Pad** of 25 sheets. **$ .75**

Sinks



347M11



347M12

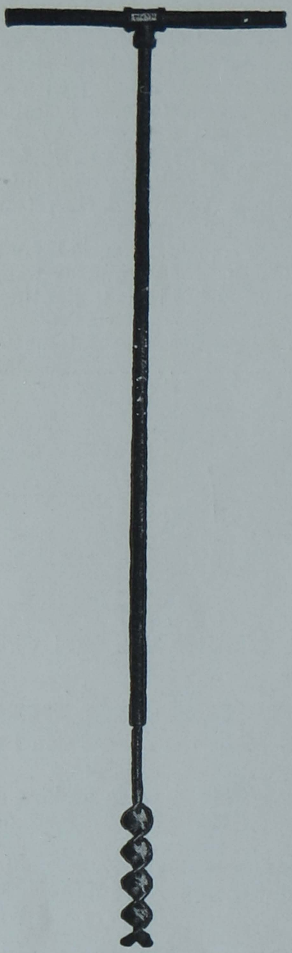
347M11 Sinks, Laboratory, Acid-Proof. Of seamless one-piece construction. Of chemical stoneware. Made from carefully selected and very dense clay. Non-porous; non-absorbent; acid, alkali and corrosion-proof, with the exception of hydro-fluoric acid. The outlets are plain, countersunk, and made to fit hard lead waste plugs.

Inside dimensions, inches, BxCxA ..	**11x9x8**	**14x10x6**	**16x8x6**	**15x14x6**	**16x12x6**	**16x16x9**	**18x10x11**	**18x14x7**	**18x14x10**
Weight, shipping, pounds............	55	65	70	85	95	115	115	110	135
Each..................	**$16.10**	**17.80**	**16.65**	**18.90**	**18.90**	**25.00**	**22.20**	**24.45**	**26.70**
Inside dimen., ins., BxCxA, cont...	**18x16x6**	**20x12x7**	**20x12x12**	**20x17x7**	**24x15x8**	**32x16x7**	**30x20x8**	**36x18x7**	**42x20x12**
Weight, shipping, pounds............	120	85	165	95	115	135	160	155	325
Each..................	**$25.55**	**23.35**	**27.75**	**26.65**	**30.00**	**36.65**	**40.00**	**44.45**	**63.90**

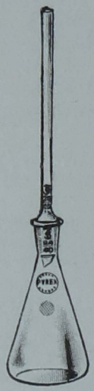
Note: Hard lead waste plugs for use with 347M11 at $3.00 additional charge.

347M12 Sinks, Laboratory, Alberene Stone. Made of natural quarried stone which is non-absorbent and highly resistant to chemical action. Joints are liquid-tight. Supplied to meet almost any specifications. Further information and details will be furnished upon request.

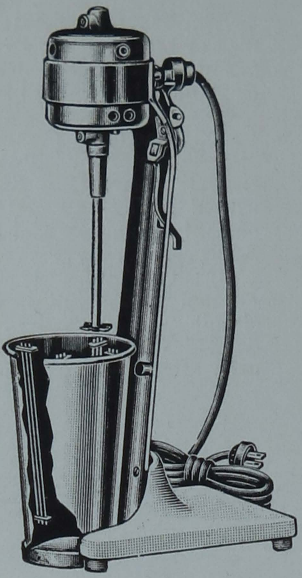
Soil Testing Apparatus



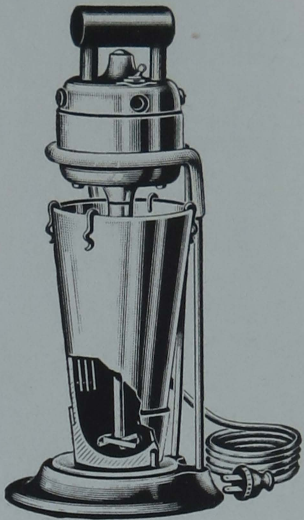
348M1



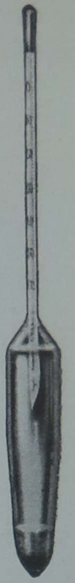
348M2



348M3



348M6



348M9

348M1 Soil Augers. Length, 40 inches; diameter, 1½ inches. Graduations every six inches on the rod aid in measuring the depth from which the sample is secured. **Each**.................. $4.50

348M2 Soil Digestion Flasks, Pyrex. Ŧ joint 24/40.

Capacity, ml.	**250**	**300**	**500**
Length of tube, approximate mm.	650	750	850
Each	**$ 2.40**	**2.55**	**2.70**
Case of 12	**$25.92**	**27.54**	**29.16**

348M3 Soil Dispersion Mixers, Bouyoucos. A. S. T. M. D-422-T. For the mechanical analysis of subgrade soils. Furnishes data for a complete particle-size accumulation curve. Stirring paddle is Monel metal, removable from the shaft of a high speed electric motor. The chrome-plated, nickel silver cup has a slightly convex bottom and baffles permanently fastened to the inside. The mixer support is chrome-plated; the base is white porcelain enamel. Complete with cord and plug. For 110 volts A. C. or D. C. **Each**.................. **$24.00**

348M4 Soil Dispersion Mixers, Bouyoucos. Same as 348M3, except for 220 volts A. C. or D. C. **Each**.............. **$24.00**

348M5 Cup, Only. For 348M3 and 348M4. **Each**.................. **$5.00**

348M6 Soil Dispersion Mixers, Bouyoucos. Similar to 348M3, except the cup has a cast brass semi-spherical bottom and detachable baffles, as recommended by the U. S. Bureau of Chemistry and Soils for the prevention of the accumulation of soils and resistance to abrasion wear. The support allows for the easy removal of the motor and stirring paddle by means of a horizontal handle attached directly to the frame of the motor. For 110 volts A. C. or D. C. **Each**.................. **$51.00**

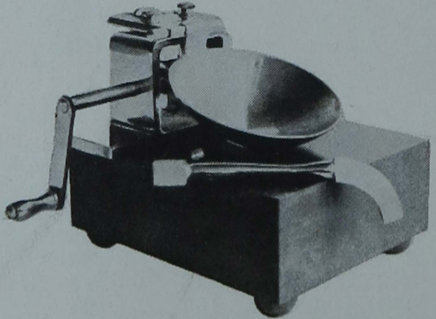
348M7 Soil Dispersion Mixers, Bouyoucos. Same as 348M6, except for 220 volts A. C. or D. C. **Each**.............. **$51.00**

348M8 Cup, Only. For 348M6 and 348M7. **Each**.................. **$24.00**

348M9 Soil Hydrometers, Bouyoucos. A. S. T. M. D-422-T. For soil colloids. Instrument has Bouyoucos scale with temperature standardarization of 67° F. Length, 11 inches. Range, 0 to 60 grams. **Each**.................. **$3.50**

348M10 Glass Test Jar. For 348M9. **Each**.................. **$2.65**

Note: For soil thermometers, see page 384.

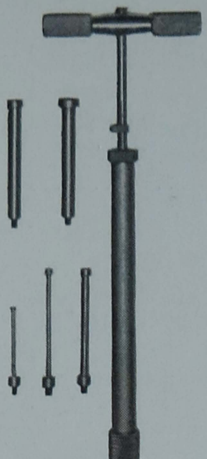


348M11

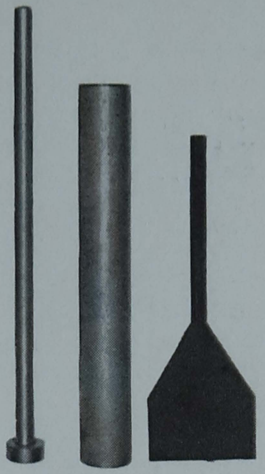
348M11 Soil Liquid Limit Machines. A. S. T. M. D-423-T. For a 100-gram sample. The end of the grooving tool is one cm. square and serves as a gauge to adjust the height of fall of the cup. The brass cup and entire mechanism are mounted on a hard rubber block. Complete with grooving tool. **Each**.................. **$45.00**

Soil Testing Apparatus, Continued

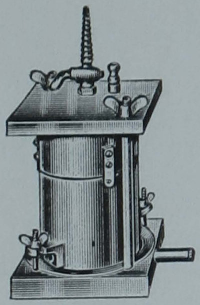
349M1



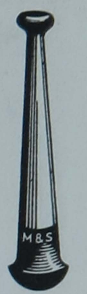
349M8, 9



349M4, 6, 7



349M10



349M12

349M1 Soil Compaction Cylinders. A. A. S. H. O. T99-38. Consists of cylindrical bronze mold, approximately 4 inches inside diameter and 4½ inches high, with a capacity of 1/30 cubic foot. The mold is furnished with a detachable base plate, and removable extension 2½ inches high. **Each** **$21.50**

349M2 Soil Compaction Cylinders. Similar to 349M1, except mold is approximately 4 inches inside diameter and 6 inches high, with a capacity of 1/20 cubic foot, furnished with a detachable base plate, and a removable extension 4 inches high. **Each** **$21.50**

349M3 Soil Sample Ejectors. (Not illustrated). A screw press for removing the soil sample from the compaction cylinder.

For	349M1	349M2
Each	**$22.00**	**22.00**

349M4 Soil Tamping Rods. Of steel, with striking face 2 inches in diameter, (approximately 3 square inches); weight, 5½ pounds; length, 22¾ inches. **Each** **$3.25**

349M5 Tamping Rod Gauge. Round steel tube for use with 349M4. 12 inches long. **Each** **$1.25**

349M6 Tamping Rod Gauge. Same as 349M5, except 18¾ inches long. **Each** **$1.25**

349M7 Soil Mixing Paddle. Steel, with round pipe handle. **Each** **$1.75**

349M8 Soil Plasticity Testers. (Soil Penetrometer). Consists of a cylinder with a spring and plunger. The plunger is graduated in one-pound divisions from 10 to 130 pounds pressure, with numerals indicating 10-pound intervals, and with a marker to indicate maximum pressure reached. The bottom of the cylinder is threaded to enable attaching the penetration needle. All parts not aluminum are dull chromium plated. Complete with set of any five 349M9 penetration needles selected. **Each** **$28.00**

349M9 Soil Penetration Needles. For 349M8 soil plasticity tester. Each consists of a dull chromium-plated steel shank of suitable diameter with a tool steel detachable tip with flat face. 6 inches long.

Tip area, sq. in..	1/20	1/10	1/5	1/4	1/3	1/2	3/4	1
Each	**$2.00**	**2.00**	**2.00**	**2.00**	**2.00**	**2.00**	**2.00**	**2.00**

349M10 Soil Permeameters. For determining the permeability to water of soil specimens compacted by the Proctor plasticity method. Apparatus consists of two-piece cylindrical mold; filter base plate machined to receive a filter stone and equipped with studs and wing nuts for assembly; upper plate equipped with outlet valve and nipple; and filter stone. **Each** **$57.50**

349M11 Filter Stone, Only. Each **$2.00**

349M12 Soil Pestles, Rubber. With polished wood handle. **Each** .... **$ .90**

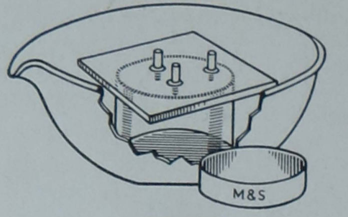
349M13

349M14

349M13 Soil Reaction Outfits, La Motte-Kenny. Designed especially for making acidity and alkalinity tests on heavy, wet, clay soils. Uses test vials and three indicators: Methyl Red (pH 4.4 to 6.0), Bromthymol Blue (pH 6.0 to 7.6) and Cresol Red (pH 7.2 to 8.8). Complete with three test vials graduated at two points; one 50 ml. bottle of each of the three indicators with pipettes; one 50 ml. bottle of special salt solution; three stirring rods; and complete instructions. In wood viewing block. **Each** **$5.00**

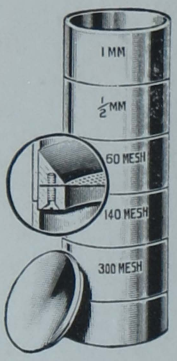
349M14 Soil Reaction Outfits, La Motte-Morgan. Can be used on soils of any texture or moisture content, with the exception of heavy wet clay, for accurately determining the acidity or alkalinity or pH of soils. The unit comes complete with everything needed for the test including four 50-ml. bottles of indicator solution: Bromcresol Green (pH 3.8 to 5.4), Chlorphenol Red (pH 5.2 to 6.8), Bromthymol Blue (pH 6.0 to 7.6), and Phenol Red (pH 6.8 to 8.4); one 50-ml. bottle of distilled water; and a special porcelain plate for making the test; a color chart for the four indicators; and instructions for use. Complete in wood box. **Each $10.00**

Soil Testing Apparatus, Continued



350M1

350M1 Soil Shrinkage Apparatus. A. S. T. M. D-427-T. For the determination of shrinkage limit, shrinkage ratio, volumetric change, lineal shrinkage and approximate specific gravity of soils. This assembly of essential parts, as illustrated, consists of porcelain dish, evaporating dish, glass crystallizing dish and a glass plate, 3x3 inches square and 1/16 inch thick, in which are cemented three brass studs. **Each** **$2.50**



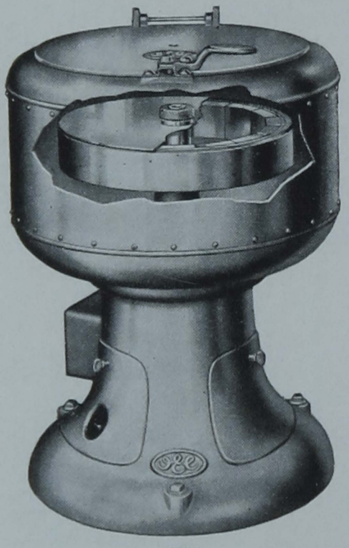
350M2

350M2 Soil Testing Sieve and Screen Sets. Meet the specifications of Technical Bulletin Number 170 of the U. S. Department of Agriculture for the method of mechanical soil anaylsis developed by the Bureau of Chemistry and Soils. Consists of five sieves and screens 2½ inches in diameter, cover, and bottom pan one inch deep. Frames are machined brass with discs held in place by removable rings to permit replacements of worn mesh, and nest closely to prevent separation.

The two coarser screens have round holes of 1.0 and 0.5 mm. diameter, respectively. The next two sieves conform to Bureau of Standards' specifications for 60 and 140-mesh. The finest sieve is of 300-mesh twilled wire cloth. **Set** **$25.00**
For soil sample cans, see page 67.

350M3 Soil Centrifuges, Moisture Equivalent, International. For determining the relative moisture equivalents of soils where the term "moisture equivalent" designates the maximum percentage of moisture which a soil can retain in opposition to a known centrifugal force. Consists of a nickel-plated bronze cylindrical head, containing sixteen nickel-plated soil boxes with wire gauze bottoms, which is attached to a shaft of a vertically mounted adjustable speed motor, and enclosed in a protecting guard. The specially designed motor is provided with a constant speed governor which, operating thru a control panel, is capable of maintaining the required speed of 2440 R. P. M. within very close limits. The improved control panel is of the totally enclosed type with all resistances and wiring on the back of the board encased within a steel cabinet.

Dimensions: Outside diameter, 19 inches; height, cover closed, 26 inches. Net weight, 200 pounds; shipping weight, 325 pounds. Complete with head, No. 882, sixteen soil boxes, No. 883, and control panel, but without portable stand. For 110 volts A. C. 50-60 cycles. **Each** **$495.00**



891
350M3

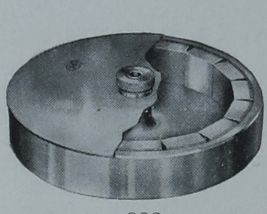
350M4 Soil Centrifuges, Moisture Equivalent, International. Same as 350M3, except for 220 volts A. C. 50-60 cycles. **Each** **$495.00**

350M5 Portable Vibrationless Stand. For 350M3 and 350M4. With angle supports and braces for supporting control panel and mounting centrifuge. Height of platform, 15 inches. **Each** **$37.00**

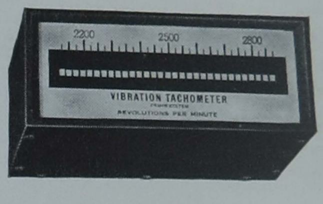
350M6 Head, No. 882. Nickel-plated bronze; cylindrical. With cover, but without boxes. **Each** **$90.00**

350M7 Soil Boxes, No. 883. Nickel-plated. For 350M6. With wire gauze bottom and cover. **Each** **$3.75**

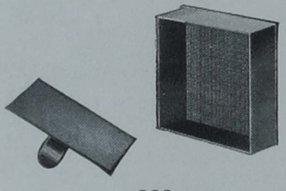
350M8 Frahm Tachometer. For soil centrifuges. Scale, 2125 to 2875 R. P. M. continuous reading. **Each** **$75.00**



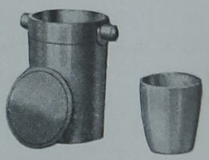
882
350M6



880
350M8



883
350M7



351-359
350M12-350M13-350M15

350M9 Soil Centrifuges, Sub-Soil, International. A. S. T. M. D-425-T. Same centrifuge as 350M3, except is supplied with eight-place head, No. 240 (see illustration page 83); eight trunnion cups, No. 351, with rubber cushions, No. 673, and eight aluminum covers, No. 359; and eight 25 ml. Gooch crucibles; but without portable stand. For 110 volts A. C. 50-60 cycles. **Each** **$380.00**

350M10 Soil Centrifuges, Sub.Soil, International. Same as 350M9, except for operation on 220 volts A. C., 50-60 cycles. **Each** **$380.00**

350M11 Heads, 8-Place, No. 240. For aluminum cups No. 351. Without cups. **Each** **$15.00**

350M12 Trunnion Cups, No. 351. With rubber cushion, No. 673. Without cover. **Each** **$1.10**

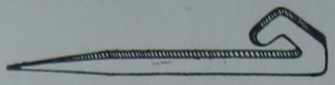
350M13 Covers, Aluminum, No. 359. For No. 351 trunnion cup. **Each** .... **$ .25**

350M14 Rubber Cushions, No. 673. Each .... **$ .25**

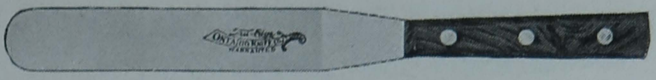
350M15 Gooch Crucibles. Capacity, 25 ml. **Each** ... **$ .44**

350M16 Soil Centrifuges for Mechanical Analysis

For Centrifuge, see 79M4.
For Head, see 83M2.
For Trunnion Ring, 100 ml., see 85M3.
For Metal Tube, 100 ml., see 85M26.
For Rubber Cushion, see 85M27.
For Soil Tube, Truog, 100 ml., see 88M13.
For Centrifuge Tube, 100 ml., see 87M18.



351M1



351M3

351M1 Spads, Surveying. For suspending plumb bob from timbers in mines. Nickel-plated steel; 2⅛ inches long. **Box** of 50 . . . . **$ .90**

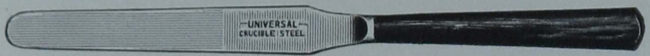
351M2 Spads, Surveying. Same as 351M1, except 1½ inches long. **Box** of 50 . . . . **$ .90**

351M3 Spatulas, Steel. With high carbon flexible steel blade and Cocobolo handle. Brass rivets.

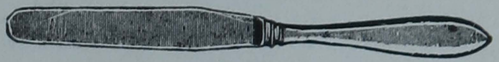
Length, blade, inches	3	4	5	6	8	10	12
Each	**$ .35**	**.40**	**.45**	**.50**	**.65**	**1.10**	**1.20**

351M4 Spatulas, Stainless Steel. Same as 351M3, except with stainless steel flexible blade and rosewood handle.

Length, blade, inches	3	4	5	6	8
Each	**$ .40**	**.45**	**.50**	**.55**	**.85**



351M5



351M7

351M5 Spatulas, Steel, Artists'. With thin, flexible, narrow steel blade and rosewood handle.

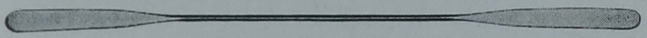
Length, blade, inches	3	4	5
Each	**$ .45**	**.60**	**.70**

351M6 Spatulas, Stainless Steel, Artists'. Same as 351M5, except with thin, flexible stainless steel blade and Cocobolo handle.

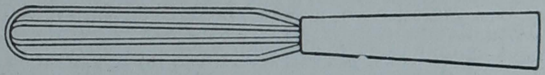
Length, blade, inches	3	4
Each	**$ .50**	**.70**

351M7 Spatulas, Steel, Nickel Plated. With polished crucible steel blade and solid steel handle.

Length, blade, inches	3	4	5	6
Each	**$ .60**	**.70**	**.80**	**.90**



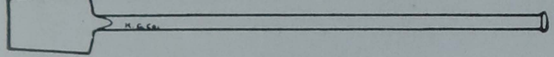
351M8



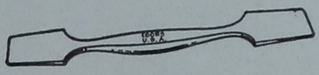
351M9

351M8 Spatulas, Pure Nickel. Double end. Overall length, 9⅜ inches. **Each** . . . . **$ .30**

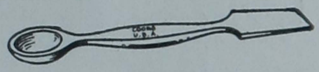
351M9 Spatulas, Wire. Wood handle. Especially designed for mixing ore charges in crucibles. **Each** **$1.00**



351M10



351M11



351M12

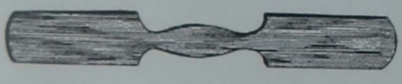
351M10 Spatulas, Glass. With 16 mm. wide blade, ground on both sides. Length, overall, 150 mm. **Each** . . . . **$ .20**

351M11 Spatulas, Coors Porcelain. Glazed. Double end.

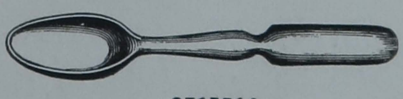
Size number	**1**	**2**	**3**	**4**	**5**	**5a**	**6**	**7**
Length, mm.	109	123	155	204	201	222	300	357
Each	**$ .28**	**.38**	**.46**	**.60**	**.80**	**.94**	**1.30**	**1.70**

351M12 Spatulas, Coors Porcelain. Glazed. Spoon on one end, spatula on other.

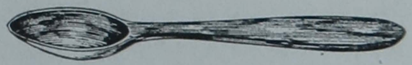
Size, number	**1**	**1a**	**2**	**3**	**4**	**4a**	**5**	**6**
Length, mm.	99	123	142	165	195	200	254	530
Each	**$ .28**	**.33**	**.44**	**.55**	**.66**	**.83**	**.94**	**3.05**



351M13



351M14



351M15

351M13 Spatulas, Horn. Double end.

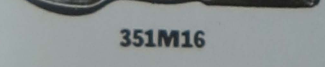
Length, inches	4	5	6	8
Each	**$ .20**	**.22**	**.25**	**.40**

351M14 Spatula Spoons, Horn. Spoon with spatula handle.

Length, inches	4	5	6	8
Each	**$ .15**	**.20**	**.25**	**.40**

351M15 Spatula Spoons, Horn. Spoon with pointed handle.

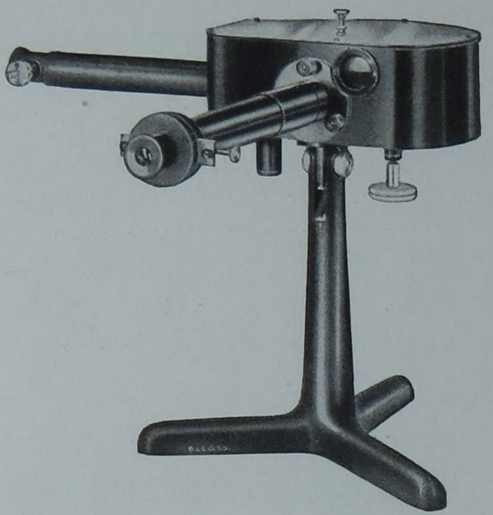
Length, inches	4	5	6	8
Each	**$ .15**	**.20**	**.25**	**.40**



351M16

351M16 Spatula Spoons, Bone. Spoon with spatula handle.

Length, inches	4	5	6
Each	**$ .30**	**.35**	**.40**



352M1

352M4

352M1 Spectrometers, B. & L., Laboratory Wavelength. Simplified constant deviation prism type. The optical surfaces and moving parts are completely closed. The dust-proof housing with removable cover plate contains the Pellin-Broca type prism, its operating mechanism and the drum which is graduated in steps of one mμ. from 400 to 600, in steps of two mμ. from 600 to 650, and in steps of five mμ. from 650 to 800. Slit width is controlled by a micrometer screw; and slit length, by a V-slide operating close to the face of the slit jaws. The focal length of the collimator objective and of the telescope objective is 162.6 mm. (–5893). The diameter of the collimator and the telescope lenses is 20 mm. The angle between the collimator and the telescope is 90°, and the eyepiece magnification is 14X. Prism index of refraction (nD) is 1.7201. Base of equivalent sixty degree-prism is 39.2. mm. Range of spectrometer is from 4000 to 8000 angstroms and the linear length of the wavelength scale is 249 mm. Complete as described with adjustable slit, eyepiece shutter with cross hairs, and eyepiece 20 mm. E. F. **Each**............ **$195.00**

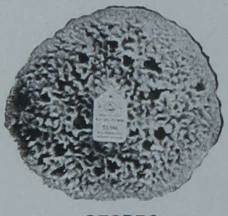
352M2 Scale Illuminator. For 352M1. Includes dry battery. **Complete**.............................. **$16.00**

352M3 Scale Illuminator. For 352M1. Includes transformer for 115-volt, 60-cycle A. C. **Each**.................... **$23.00**

352M4 Spectroscopes, B. & L., Bunsen. Completely adjustable throughout. The prism is held by a strong spring clip and may be moved at will. The prism table can be adjusted precisely by three thumb screws, thus allowing the operator to demonstrate the effect of tilting the prism. The slit, the scale and the viewing telescopes may all be focused. The scale, 15 mm. in length, is divided into tenths of millimeters. A knurled thumb screw convenient to the left hand and outside of the prism case controls the locking device for the horizontal movement of the viewing telescope. The slit is actuated by a thumb screw on the right hand side of its tube. The pillar base is a heavy iron casting and forms a very strong and steady support. The finish is of reagent and rust-proof crackled lacquer, black and chromium. **Each**.. **$50.00**

352M5

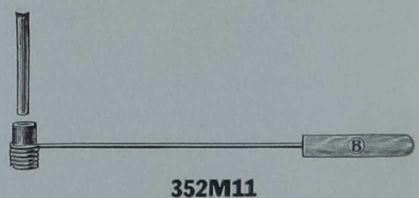
352M9



352M6

DUPONT
cellulose
SPONGE
SOFT
TOUGH
DURABLE

352M8



352M11

352M5 Speed Indicators, Starrett. May be run at high speed without heating. Working parts are encased; instrument is nickel-plated. Dial plate has two rows of figures, reading right or left as shaft may run. Complete with steel spindle and two rubber tips. **Each**.................. **$1.50**

352M6 Sponges, Grass. Unbleached. For laboratory and general use. Average 10 to 14 in a pound. **Pound**..... **$1.80**

352M7 Sponges, Sheepswool. Very strong and durable. Extra large. **Pound**............................ **$5.00**

352M8 Sponges, Cellulose. Strong; durable; free from grit. Can be sterilized by boiling. Not affected by ordinary cleaning chemicals.

Width, inches	3½	3⅞
Length, inches	5¼	6¼
Thickness, inches	1⅝	2
Quantity in case	72	48
Each	**$ .45**	**.75**

352M9 Spoons, Deflagration or Combustion. Iron. Offset, copper coated steel handles are spot welded to bowls.

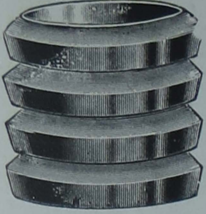
Diameter, bowl, inches	½	⅞
Length, spoon, inches	15½	17½
Each	**$ .09**	**.10**

352M10 Spoons, Deflagration or Combustion. Brass. Offset, brass handles are riveted to bowls.

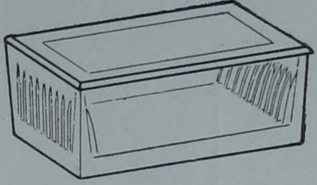
Diameter, bowl, inches	½	⅞
Length, spoon, inches	15½	17½
Each	**$ .12**	**.15**

352M11 Spoons, Sodium. Cylindrical brass cup is held within a coil of brass wire terminating in a wood handle. A brass ram rod is included, one end of which is hemispherical, the other flat. Inside diameter of cup, ¼ inches; depth of bore, ⅝ inches. Length overall, 9 inches. **Each**....... **$ .30**

For spatula spoons, see page 351.



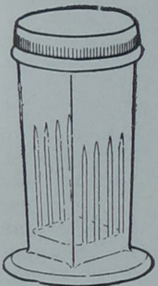
353M1



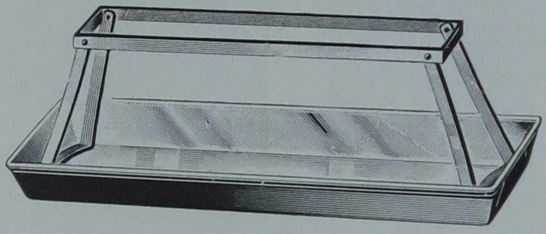
353M2

353M1 Staining Dishes. Glass staining dish or Syracuse watch glass. 2⅝ inches in diameter. Beveled edges and bottom grooves are ground to permit air-tight stacking. Provided with frosted number plate. **Dozen**............ **$2.00**

353M2 Staining Dishes, Glass. With cover. Grooved to accommodate 10 single slides or 20 slides placed back to back. **Each**.. **$ .40**



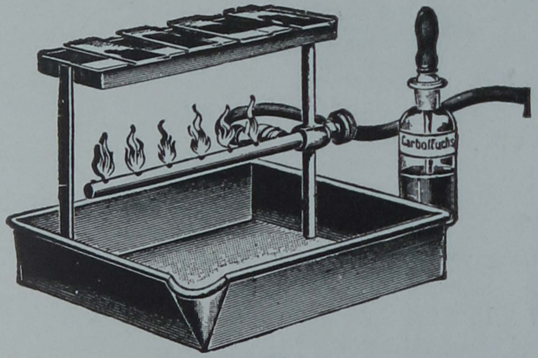
353M3



353M4

353M3 Staining Jars, Coplin, Glass. With ground-on cover. Grooved to accommodate 10 slides. **Each**..... **$ .40**

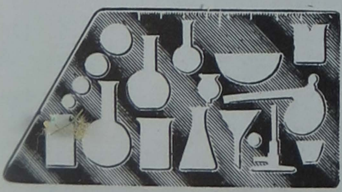
353M4 Staining Racks, Microscope Slide. Holds slides during the staining or flushing process. A small gas burner may be placed under the rack to hasten warming or drying. Collapsible to save storage space. Polished copper drip pan, 17¼x5⅜x1⅝ inches, lined with pure block tin. Brass rack, 6 inches high. **Each**............................. **$6.50**



353M5

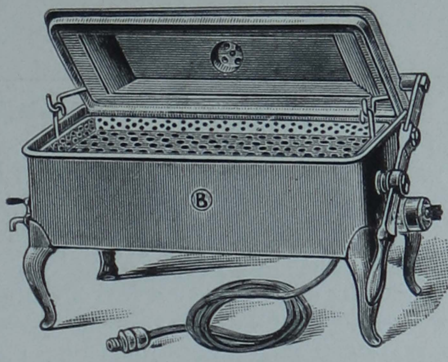
353M5 Staining Racks, Rabinowitch-Kemper. Designed especially for hot staining processes where the slides are to be flooded with the staining solution. The slides are placed on top of the upright frame, and the stain, poured over them, drips into the copper pan, which has a flared pourout to facilitate collection and re-use of the excess stain.

Rack is equipped with an adjustable six port tubular burner. Upright stands and burner are brass; pan is heavy sheet copper. The entire rack is plated to resist corrosion. Total height, 8 inches· pan, 8½x6¼x1 inches. Rubber tubing for burner not included. **Each**..................... **$9.50**



353M6

353M6 Stencils, Chemistry. For making outline drawings of chemistry apparatus. Made of transparent flexible sheet celluloid with cut-outs of common pieces of chemistry apparatus. Has a centimeter and millimeter scale on top edge. Size, 7x12 cm. **Each**............... **$ .15**



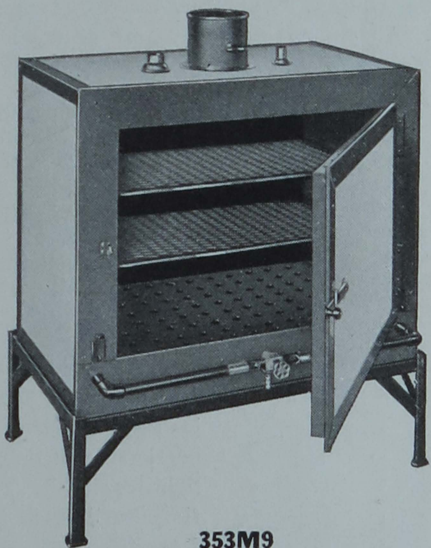
353M7

353M7 Sterilizers, Electric. Made of heavy, polished and nickel-plated copper, tinned inside, and provided with draincock. Hinged lid with steam escape and perforated tray are lifted together by a lever handle. Controlled by three-heat switch and automatic cut-out. Complete with 6 feet of cord and plug for operation on 110 volts A. C. or D. C.

Size........................	**1**	**2**	**3**
Length, inches................	10	13	14½
Width, inches.................	4¾	5	6
Depth, inches.................	2½	3¼	3¾
Minimum watts.............	125	125	200
Maximum watts.............	500	500	800
Each......................	**$33.00**	**36.00**	**40.00**

353M8 Sterilizers, Electric. Same as 353M7, except for 220 volts A. C. or D. C.

Size........................	1	2	3
Each......................	**$33.00**	**36.00**	**40.00**



353M9

353M9 Sterilizers, Hot Air, Lautenschlaeger. With adjustable control valve for artificial, natural or gasoline gas. Constructed of polished blue steel with asbestos insulation.

Patented baffle construction overlying the single row of bunsen burner flames concentrates the heat at the bottom of the air channels and together with the usual damper in the air chimney the temperature variation between the remote stations of the sterilizing chamber is approximately 5° C. Sterilizer can be heated to 150° C. in about 15 minutes. Sizes 3 and 4 are equipped with double doors and cremorne bolt. Supplied with angle iron stand, 9 inches high.

Size..............	**1**	**2**	**3**	**4**
Number of shelves..	1	2	3	3
Length, inside, inches	18	24	30	36
Height, inside, inches	12	18	24	30
Depth, inside, inches	9	14	18	20
Each..............	**$62.50**	**75.00**	**145.00**	**175.00**

353M10 Sterilizers, Hot Air, Lautenschlaeger. Same as 353M9, except stainless steel.

Size..............	1	2	3	4
Each..............	**$80.00**	**107.00**	**180.00**	**260.00**

Note: For other Sterilizers and Autoclaves, see page 5.

Stills, Water

U. S. Government Regulations

Federal regulations require us to secure a permit for the shipment of each water still if the destination is within the United States. To enable us to secure this permit we must have the buyer's affidavit in triplicate stating the purpose for which the still will be used (such as, "distilling water for laboratory use") and its location. This affidavit must be sworn to before a notary public. The proper affidavit forms will be supplied by us upon request free of charge.

Stills, Water, Precision. Every still is a hard water model. Every detail involved in the production of chemically pure water is taken into account in their design and construction. The outstanding features are briefly summarized as follows:

Pre-Heating. Vapors are condensed by contact with surfaces cooled by the inlet water which reaches almost 200° F. before entering the evaporator.

Gases Liberated. Dissolved gases and volatile impurities are vented before distillation.

Constant Water Level. An overflow pocket and tube limits the water height to a pre-determined level. A ball-check valve in the water supply line guards against any siphoning action.

Tall Vapor Dome. Equipped with several baffles which intercept vapors and hold back entrained moisture and solids.

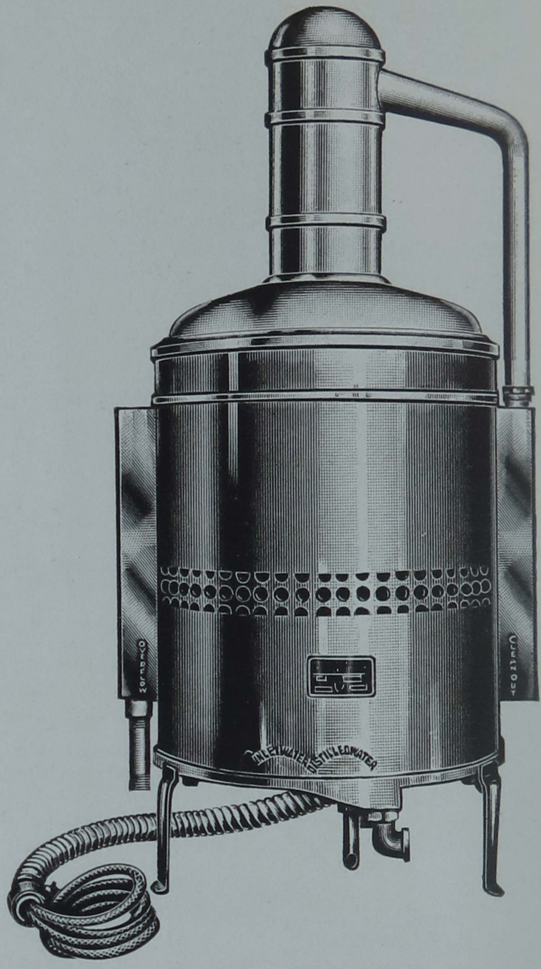
Flush and Bleed. A nipple protrudes through the evaporator side at water level. By connecting a "T" and pair of valves when installing the still, solid impurities can be bled from the surface of the water during operation and the upper valve used to flush the evaporator with raw water under pressure after each still run.

Easy to Clean. Other than the heating coil there are no coils or tubes apt to clog, "lime" or leak. Evaporator interior is exposed by removing the dome.

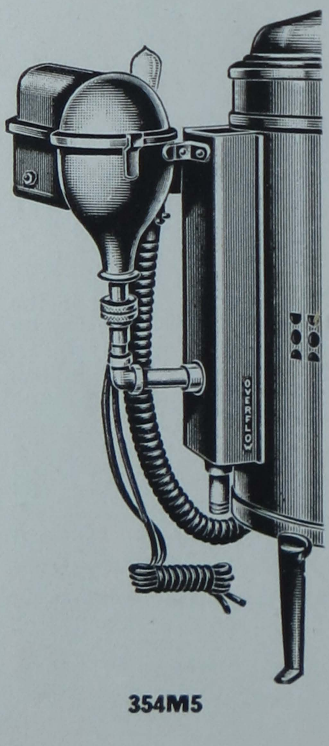
Compact. All connecting unions are grouped at the bottom of the still to simplify installation. Still has removable legs for supporting on shelf, table or tank.

Quality Throughout. All surfaces which come in contact with the distilled water are heavily coated with pure block tin. Evaporator bottom castings are alloy bronze. Body wall construction is of heavy sheet copper except on those stills heated by gas, which are of Monel metal to resist the corrosive influence of combustion products. Each still is rigidly tested before shipment to insure leak-proof construction, rated capacity and purity of distillate.

Wall Mounting Bracket. Each still includes removable legs for table mounting and a sturdy metal bracket for wall mounting.



354M1



354M5

Stills, Water, Precision, Electric. The immersion type heating coils can be replaced easily and quickly when necessary. Double-walls are lined with insulating refractory material. Still includes 6 feet of insulated cable and squeeze connectors for any standard knockout box. Connections must be made to a line of suitable capacity for the still and never connected to a regular lighting circuit. The water inlet is ¼-inch I. P. S.; the overflow, bleeder, and drain pipe connections are ½-inch I. P. S. Without flush and bleed valves or automatic cut-off.

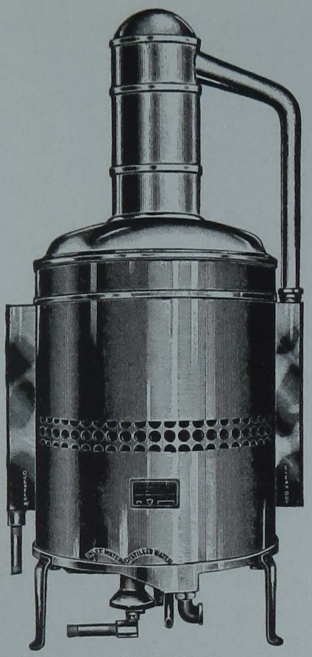
Capacity, gallons per hour	**1**	**1½**	**2**	**3**
Watts	2500	3750	5000	7500
Space required, inches	30x15	30x15	36x18	36x18
354M1 Stills. For 110 volts A. C. or D. C. **Each**	**$88.00**	**98.50**	**122.00**	**135.00**
354M2 Stills. For 220 volts A. C. or D. C. **Each**	**$88.00**	**98.50**	**122.00**	**135.00**
Heating Units, Only.				
354M3 For 110 Volts A. C. or D. C. **Each**	**$20.00**	**26.00**	**30.00**	**38.50**
354M4 For 220 Volts A. C. or D. C. **Each**	**$20.00**	**26.00**	**30.00**	**38.50**

Automatic Cut-Off Attachments. For use with any of above stills. Will safe-guard coils, and protect still against operation with insufficient water.

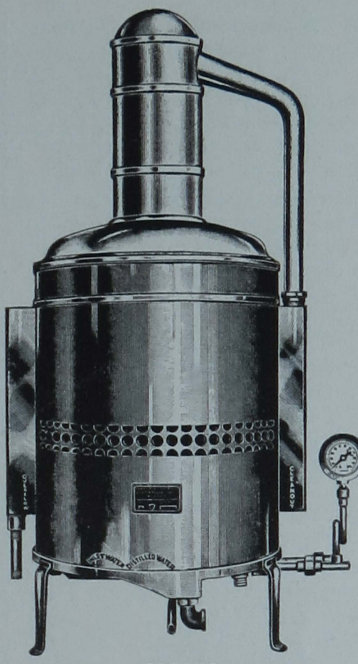
For stills, capacity, gallons per hour	1	1½	2	3
354M5 For 110 Volts A. C. **Each**	**$35.00**	**35.00**	**35.00**	**55.00**
354M6 For 110 Volts D. C. **Each**	**$35.00**	**35.00**	**35.00**	**95.50**
354M7 For 220 Volts A. C. **Each**	**$35.00**	**35.00**	**35.00**	**35.00**
354M8 For 220 Volts D. C. **Each**	**$35.00**	**35.00**	**35.00**	**35.00**

Note: For flush and bleed valve attachments, see page 355.

Stills, Water, Continued



355M1



355M3

355M1 Stills, Water, Precision, Gas Heated. Of the same general construction as stills shown on page 354. High in efficiency and low in fuel consumption. Polished Monel metal is used in construction of the body, side pockets and wall surfaces exposed to the flame or products of combustion.

The evaporator bottom is cast bronze with numerous studs projecting downward toward the flame. The burner is suitable for gases up to 1100 B. t. u's.

The inlet water connection is ¼-inch I. P. S.; the overflow, bleeder, and drain are ½-inch I. P. S.; and the gas connection is ⅜-inch I. P. S. Complete with burner, but without flush and bleed valves or automatic cut-off attachment.

Capacity, gallons per hour	**1**	**2**	**3**
Height, inches	30	36	36
Diameter, inches	15	18	18
Each	**$83.00**	**110.00**	**120.00**

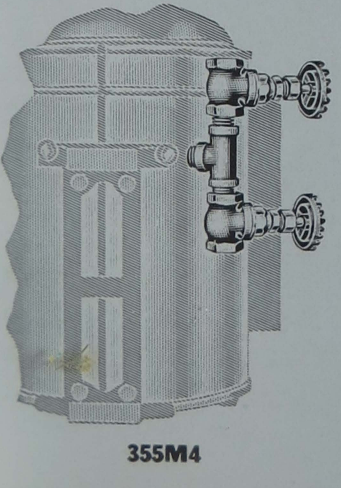
355M2 Automatic Cut-Off Attachments. For 355M1 stills. Prevents operation of still when there is insufficient amount of water. When ordering, specify current characteristics.

For stills, capacity, gallons per hour	1	2	3
Each	**$55.00**	**55.00**	**55.00**

355M3 Stills, Water, Precision, Steam Heated. Of same general construction as stills shown on page 354. Where steam under sufficient pressure (at least 10 pounds) is available, steam-heated stills are the most economical. Steam-heated stills use steam for heating only. Distilled water is obtained by continuous evaporation of water fed to the evaporator. The steam for heating is confined within seamless tinned copper coils. At no time does it enter into the raw water, vapors or pure distillate. Ratings refer to normal free running operation at about 12 pounds steam pressure. Steam coils are of heavy seamless copper tubing, tested at 250 pounds per square inch. They are coated with pure block tin and equipped with unions for connection to steam and return lines. The inlet steam connection is ⅜ inch I. P. S.; outlet and inlet water connections are ¼ inch I. P. S.; and the overflow, bleeder and drain are ½ inch I. P. S.

Complete with pressure gauge, but without flush and bleed valves.

Capacity, gallons per hour	**1 to 2**	**2 to 4**
Space required, inches	32x15	36x18
Each	**$83.00**	**110.00**



355M4

355M4 Flush and Bleed Valve Attachments. For application to above stills or those shown on page 354. Each time the still is shut down and before the sediment accumulated in the evaporator has had time to harden, the drain valve at the bottom of the still is opened and then the flush valve opened to force a stream of water into the evaporator to wash out the soft deposits.

When the raw water supply contains a large amount of suspended matter and foam-producing constituents, the bleed valve can be opened about half way, while the still is in operation, to "bleed away" solids and foam-producing substances, thus cutting down scale formation.

Complete with "T" connection. **Set**	**$5.00**

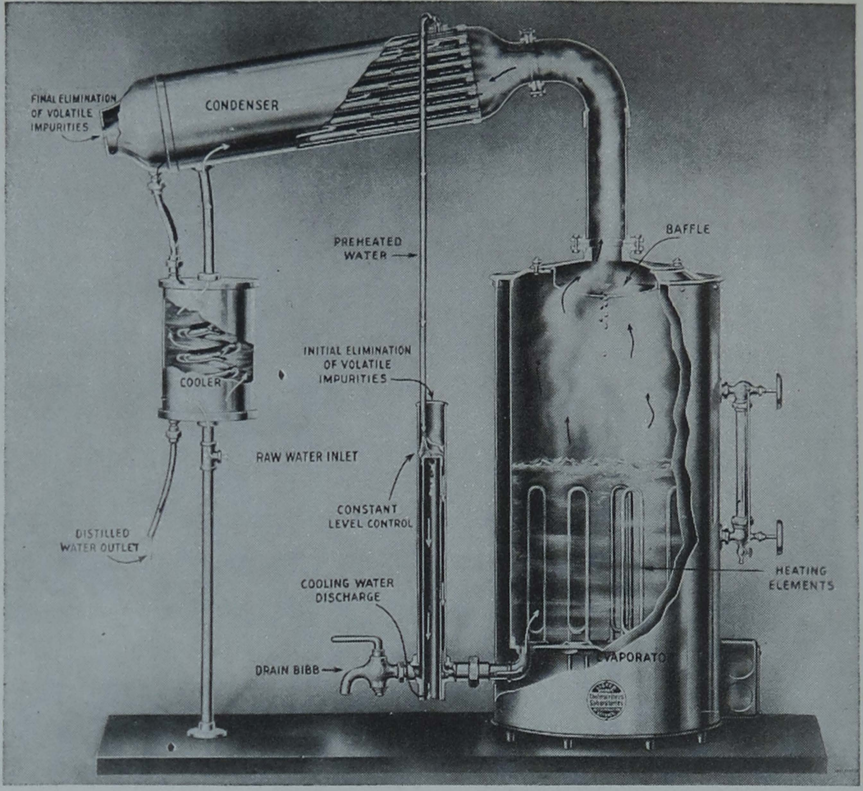
Stills, Water, Continued

Stills, Water, Barnstead. Constructed according to scientific principles and of the finest materials, including the best grades of heavy, cold-rolled copper, seamless brass tubing; bronze castings and block tin tubing. All parts coming in contact with the water are lined with pure straits block tin.

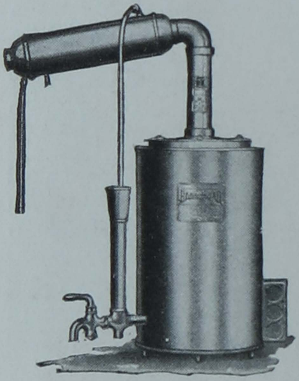
The counter-current system of condensation is used which automatically preheats to 180° to 200° F. in the condenser which is vented to allow dissolved gases and volatile impurities to escape. The evaporator is furnished with an improved type of dished baffles with center drain which prevents entrained drops from being carried up by the ascending steam. Clean pure dry steam is delivered to the condensing tubes of the horizontal, inclined condenser.

A constant-level device and automatic overflow maintain the water at a constant level within the evaporator, thereby automatically taking care of any fluctuations in supply and flow of feed water.

Every still meets rigid requirements for safety. There are no exposed, dangerous flames or unconsumed, inflammable gases. When correctly produced, Barnstead single-distilled water is free from both bacteria and bacterial toxins, and reveals a remarkable freedom from gaseous, organic or inorganic impurities. The following table is from a certified analysis showing the composition of water produced by a Barnstead single still:



	Parts Per 100,000		Parts Per 100,000		Parts Per 100,000
Total Solids	0.39	Nitrogen as		Sediment	none
Volatile Solids	0.28	Free Ammonia	0.0044	Turbidity	none
Inorganic Solids	0.11	Albuminoid	0.0007	Color	none
Chlorine	0.00	Nitrites	0.0000	Iron	0.0000
Dissolved Oxygen	0.00	Nitrates	0.000	Hardness	0.00
Total Bacteria per ml.	none	Free Carbon Dioxide	0.00	pH Value at 20° C.	6.5



356M1

356M1 Stills, Water, Barnstead, Electrically Heated. When ordering specify current characteristics.

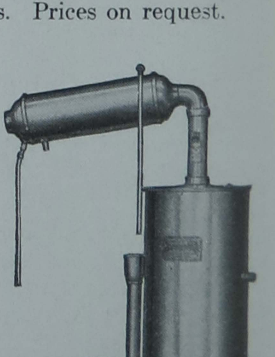
Capacity, gallons per hour	½	1	1½	2	3	5	10
Width, total, inches	18	18	18	23	23	28	40
Height, Total, inches	20	22	26	26	28	34	43
Service lines, I. P. S., inches.							
Water	¼	¼	¼	¼	⅜	⅜	½
Waste	⅜	⅜	⅜	⅜	½	¾	1
K. W. rating	1.3	2.6	4	6	7.8	13	26
Cooling water, gallons per hour	4	8	12	16	24	40	80
Weight, shipping, approximate pounds	45	50	60	65	70	120	250
Each	**$56.00**	**77.00**	**98.00**	**123.00**	**152.00**	**300.00**	**585.00**
356M2 Automatic Low Water Cut-Off. For 356M1. For 110 volts, single phase A. C. only. **Each**	**$50.00**	**52.00**	**54.00**	**56.00**	**59.00**	**95.00**	**170.00**

Note: Automatic cut-offs can be supplied for other current characteristics. Prices on request.

356M3 Stills, Water, Barnstead, Gas Heated. Adjustable for gases ranging from 450 to 1100 B. t. u's. per cubic foot. Gas consumption is based on manufactured gas with heating value of 530 B. t. u's. per cubic foot. When ordering, specify kind of gas, gas pressure and B. t. u. content.

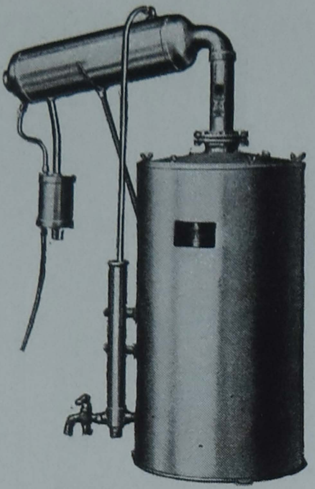
Capacity, gallons per hour	½	1	1½	2	2½	5	10
Width, total, inches	21	21	22	24	24	32	40
Height, total, inches	21	21	21	23	27	39	52
Service lines I. P. S., inches:							
Water	¼	¼	¼	¼	⅜	⅜	½
Gas	⅜	⅜	½	½	½	¾	1½
Waste	⅜	⅜	⅜	⅜	½	¾	1
Gas consumed, approx. cu. ft. per hr.	9	18	27	36	45	90	180
Cooling water, gallons per hour	4	8	12	16	24	40	80
Weight, shipping, approximate pounds	50	50	65	75	85	170	350
Each	**$49.00**	**62.00**	**76.00**	**98.00**	**122.00**	**168.00**	**343.00**
356M4 Automatic Low Water Cut-Off. For 356M3. When ordering specify current characteristics. **Each**	**$58.00**	**60.00**	**62.00**	**64.00**	**69.00**	**77.00**	**90.00**

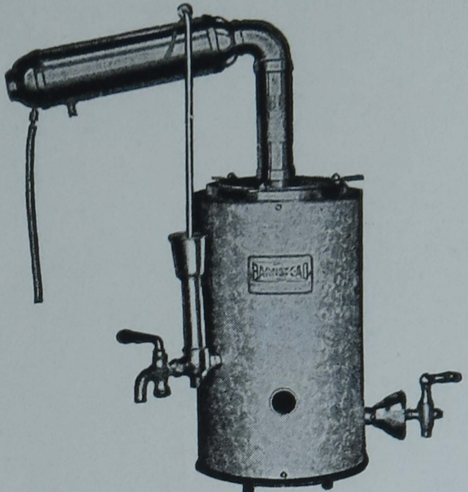
Stills, Hard Water Model: Where the raw water is excessively high in mineral content, a hard water model of any of the above Barnstead stills can be obtained at 10% additional cost.



356M3

Stills, Water, Continued


357M1



357M2

357M1 Stills, Water, Barnstead, Steam Heated. Of the same general construction as described on page 356 Rated capacities are with steam at 60 pounds gauge. When ordering specify steam pressure at which still will be operated.

Capacity, gallons per hour	**1**	**2**	**5**	**10**	**15**	**30**	**50**	**75**	**100**
Width, total, inches	19	21	24	36	46	54	63	75	75
Height, total, inches	23	26	33	42	48	59	108	114	123
Service lines I. P. S., inches:									
Water	¼	¼	⅜	½	½	¾	¾	1	1¼
Steam	⅜	⅜	½	¾	¾	1¼	1½	2	2½
Return	¼	¼	⅜	½	½	½	¾	¾	1
Waste	⅜	⅜	¾	1	1¼	1¼	2	2	2½
Boiler H. P. Drawn	⅓	⅔	1.7	3.4	5.1	10.2	17	26	34
Steam consumed per hour, pounds	9	18	45	90	135	270	475	700	940
Cooling water per hour, gallons	8	16	40	80	120	240	550	825	1100
Weight, shipping, approximate pounds	45	60	115	220	350	550	1100	1400	1700
Each	**$74.00**	**106.00**	**159.00**	**230.00**	**340.00**	**485.00**	**875.00**	**1085.00**	**1410.00**

Stills, Water, Barnstead, Battery Service. Of the same general construction as the laboratory models shown on page 356, except that the outer supporting casing is made from galvanized rust-proof Armco sheet and all other parts are finished with a satin nickel finish.

357M2 Stills, Water, Barnstead, Battery Service, Gas-Heated. When ordering, specify type of gas and B. t. u. content.

Capacity, gallons per hour	**½**	**1**
Width x height, total inches	22x23	22x23
Water connection, I. P. S., inches	¼	¼
Gas connection, I. P. S., inches	⅜	⅜
Waste connection, I. P. S., inches	⅜	⅜
Weight, shipping, pounds	50	50
Each	**$31.00**	**39.00**

357M3 Stills, Water, Barnstead, Battery Service, Electrically Heated. When ordering specify current characteristics.

Capacity, gallons per hour	**½**	**1**
Width x height, total inches	19x23	19x23
Water connection, I. P. S., inches	¼	¼
Waste connection, I. P. S., inches	⅜	⅜
K. W. consumption	1.3	2.6
Weight, shipping, pounds	50	50
Each	**$42.00**	**66.00**

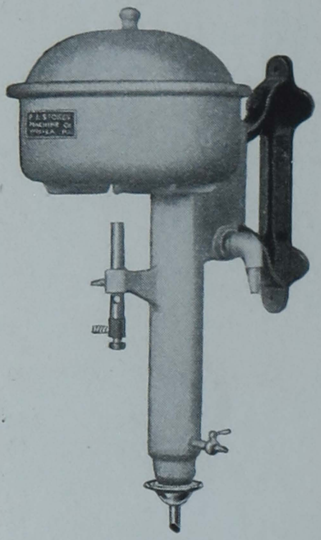
357M4 Storage Tanks, Water. For distilled water. Suitable for use with laboratory type water stills. Constructed of heavy sheet copper uniformly and heavily coated inside with pure block tin to safeguard purity of the distillate. Tank is amply reinforced with double locked seams, and carefully soldered with pure block tin. They are of the vertical type and include a removable cover allowing access to interior; inlet tubulature for distilled water entrance; tin-lined brass bibcock; reinforced gauge glass; sturdy iron support. Supports for 10- and 15-gallon tanks, 10 inches high; for 25-gallon tank, 15 inches high. Finished in durable olive-green.

Capacity, gallons	**10**	**15**	**25**
Height x diameter, inches	14x15	20x15	24x18
Weight, shipping, pounds	51	55	75
Each	**$25.00**	**30.00**	**42.50**

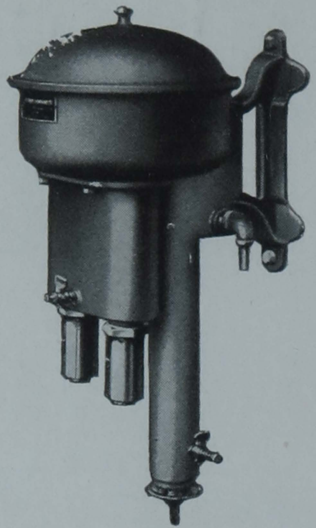
357M5 Storage Tanks, Water. For distilled water. Similar to 357M4, except made of aluminum and are of welded construction. **Each** . . . **$25.00** **30.00** **42.50**

357M4

Stills, Water, Continued

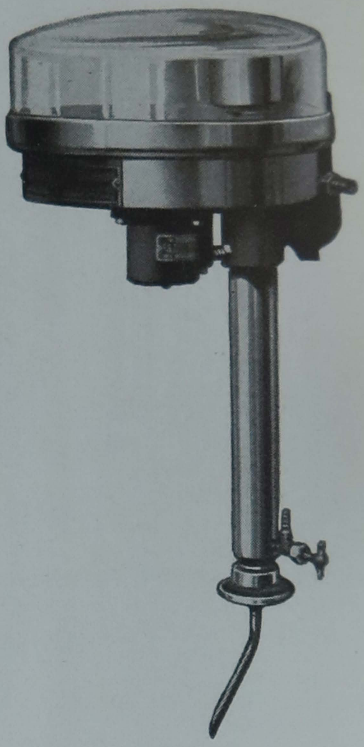


358M1



358M2

358M4



358M5

358M1 Stills, Water, Stokes, Gas-Heated. Produce a high quality distillate, simple to operate and easy to clean. The seamless brass condenser tube and all parts coming in contact with the water vapor or with the distillate are heavily coated with pure block tin. The boiling chamber cover is removable and the chamber may be cleaned readily. The special cast iron construction prevents damage should the feed water supply be interrupted and the direct heat of the gas flame, cause overheating. When ordering specify type of gas and B. t. u. content.

Capacity, gallons, per hour	½	¾	2½
Height, inches	24	24	48
Weight, shipping, pounds	75	75	205
Each	**$27.00**	**30.00**	**85.00**

358M2 Stills, Water, Stokes, Electrically-Heated. When ordering, specify current characteristics.

Capacity, gallons per hour	½	**1**	**3**
Height, inches	24	24	48
Watts required	2000	3000	9000
Weight, shipping, pounds	75	75	205
Each	**$50.00**	**60.00**	**140.00**

358M3 Automatic Low Water Cut-Offs. For 358M1 and 358M2. Prices on application.

358M4 Stills, Water, Stokes, Steam-Heated. An efficient method of baffling, which forces the steam to reverse direction completely three times before it enters the condenser tubes, separates all entrained drops of raw water from the vapor. When ordering specify steam pressure.

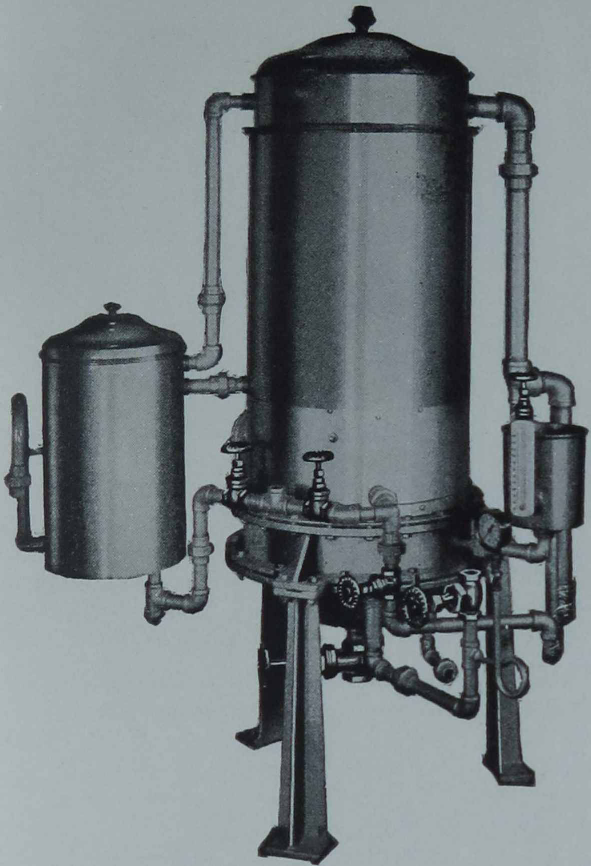
Capacity, gallons per hour	¾	**2¾**	**5**	**10**	**25**
H. P. required	½	1	2	4	10
Weight, shipping, pounds	75	205	310	360	900
Each	**$35.00**	**95.00**	**150.00**	**210.00**	**350.00**

358M5 Stills, Water, Stokes, Electric, Pyrex. Special features include a Pyrex glass cover which makes operation visible and lifts off for easy cleaning; a triple vapor baffle, which prevents droplets of water from passing over into condenser and contaminating distillate; solid tin condenser tube and funnel; a special thermal switch embedded in the heaters which automatically turns off the current whenever the temperature of the still rises above normal owing to failure of water supply or accumulation of scale. A gas eliminator releases dissolved gases and volatile impurities from the raw water before it enters the boiling chamber and a deconcentrator is especially helpful in hard water districts. The boiling chamber is made of heavy copper; chromium-plated finish. Capacity, one gallon per hour. When ordering specify current characteristics. **Each**............ **$95.00**

358M6 Stills, Water, Stokes, Gas-Heated. Otherwise same as 358M5. When ordering, specify type of gas and B. t. u. content.
Each............ **$60.00**

358M7 Floor Stands. For Stokes stills listed above. **Each**............ **$8.00**

Stills, Water, Continued



359M1

359M1 Stills, Water, Precision, Industrial, Steam Heated. Will handle any kind of water, no matter how hard or polluted. Requires a steam pressure of 10 to 35 pounds at the gauge for rated capacity, although it can be supplied to operate at pressures as low as 6 pounds at the gauge. The body proper of each still is of heavy gauge sheet copper. Steam coils are of extra heavy seamless copper tubing tested to 250 pounds per square inch.

All surfaces with which the distilled water comes in contact are heavily coated with pure block tin to insure purity of the distillate. Each still comes equipped with flush, drain and bleed valves. By opening the flush and drain valves when the still is shut down, a forceful stream of raw water flushes out soft accumulated sludge. By leaving the bleed valve slightly open during still operation, foam and solid impurities are removed from the surface of the boiling water.

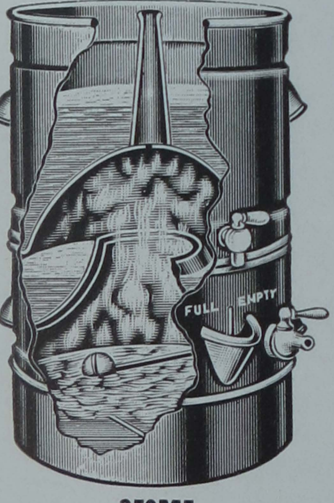
Complete with cast iron legs; steam gauge; all immediate pipes and fittings; and five high-grade valves for water supply, bleed, flush, drain and steam supply.

Capacity, gallons per hour	**5**	**10**	**15**	**25**
Steam required, pounds per hour	45	90	135	225
Steam pressure required, pounds	10-15	10-15	20	20
Water required, gallons per hour	40	80	120	200
Weight of still in operation, pounds	140	250	475	600
Height, inches	36	52	62	65
Width, inches	24	30	42	40
Depth, inches	31	33	38	48
Each	**$165.00**	**250.00**	**360.00**	**495.00**

359M2 Wall Brackets. For wall mounting. Supplied at additional cost. **Each** **$10.00 10.00 15.00 25.00**

359M3 Aerators. For increasing the palatability of water when used for drinking purposes. Supplied at additional cost. **Each** **$7.50 7.50 7.50 10.00**

359M4 Stills, Water, Precision, Industrial. Capacity, 50 to 150 gallons. Prices and information on request.

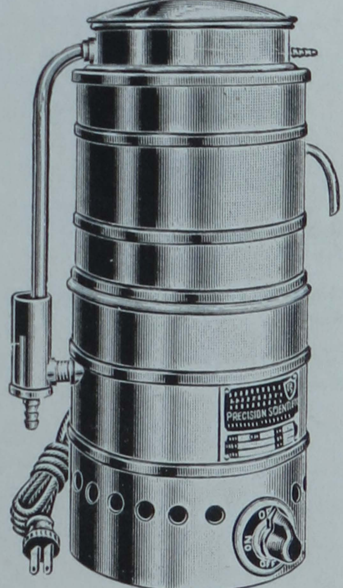


359M5

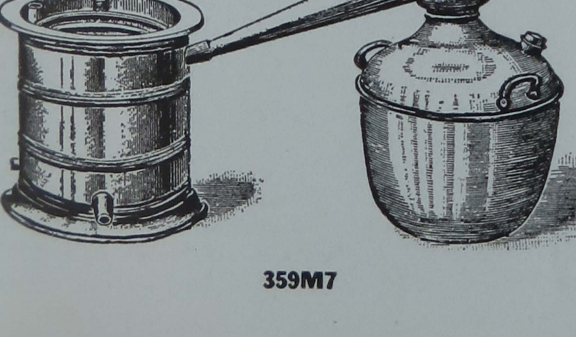
359M5 Stills, Water, Ralston. Capacity will vary from one to three quarts of distillate per hour. Heat may be applied by any convenient flame heater, coal fire or oil stove. Still consists of three compartments: an evaporator, condenser, and distilled water storage chamber. Volatile impurities and dissolved gases are expelled through a vent tube. The still is constructed of thick copper sheet, coated on the inside with pure block tin to insure purity of distillate. Outside is highly polished. Fittings are brass. Overall height, 14 inches; diameter, 9 inches. **Each** **$19.00**

359M6 Stills, Water, Midget. Electrically heated. Capacity, one quart per hour. Produces an automatic and continuous supply of distilled water. Constructed entirely of heavy brass and copper. Evaporating and condensing surfaces are coated with pure block tin to safeguard purity of distillate; the exterior is nickel-plated and highly polished. The still can be installed wherever a water supply and ordinary 110 volts A. C. or D. C. electric current is available.

Dimensions: 23 inches in height; 7½ inches in diameter; 11 inches overall width. Net weight, 12 pounds; shipping 25 pounds. Current consumption, 880 watts. For 110 volts A. C. or D. C. **Each** **$42.50**



359M6

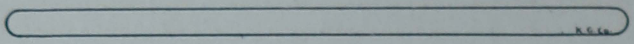


359M7

359M7 Stills, Retort and Condenser. Recommended for use in conjunction with zinc worm condensers, for distilling water, spirits, oils, etc.; or recovering ether, alcohol and similar solvents. Retort and conveyor tubes are of heavy copper; thoroughly tinned inside, coated with metallic spray outside. All joints are carefully soldered. Each retort is equipped with a brass screw plug with compressible washer, and a pair of heavy brass handles.

Capacity, gallons	**1**	**2**	**5**
Diameter, outside, inches	$8\frac{13}{16}$	$10\frac{7}{8}$	$15\frac{3}{4}$
Diameter, opening, inches	$2\frac{3}{4}$	$3\frac{1}{2}$	$4\frac{3}{4}$
Height of body, inches	$7\frac{1}{2}$	$9\frac{5}{8}$	$12\frac{1}{4}$
Height, overall, inches	$11\frac{11}{16}$	$14\frac{3}{4}$	$17\frac{3}{4}$
Length of delivery tube, inches	$9\frac{7}{8}$	$10\frac{1}{2}$	$15\frac{1}{2}$
Complete	**$18.25**	**21.75**	**38.50**
359M8 Retort, Only. Each	**$10.75**	**13.00**	**24.50**

Stirring Apparatus



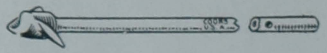
360M1

360M1 Stirring Rods, Glass. Annealed, with ends rounded.

Diameter, inches	⅛	3/16	¼	⅜	⅜
Length, inches	5	8	10	12	15
Dozen	**$ .15**	**.30**	**.45**	**.80**	**1.20**
Gross	**$1.50**	**2.50**	**4.50**	**9.00**	**12.00**

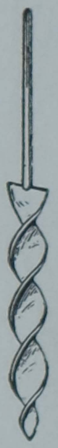
360M2 Stirring Rods, Bakelite.

Length, inches	5	10
Each	**$ .70**	**1.00**

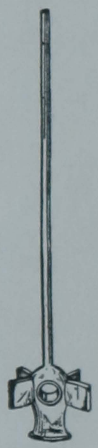


360M3

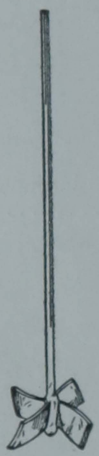
360M3 Stirring Rods, Coors Porcelain. Glazed. Diameter of stem, 8 mm.; length of stem, 130 mm.; length overall, 142 mm.; diameter of blade, 40 mm. **Each** . . . . **$ .55**



360M4



360M5

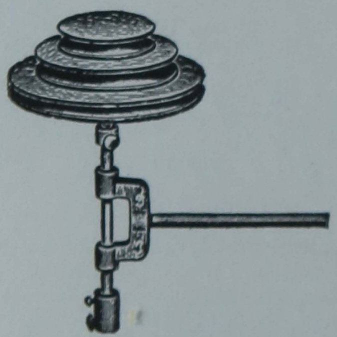


360M6

360M4 Stirring Rods, Glass. Used with stirring apparatus. **Each** **$1.00**

360M5 Stirring Rods, Glass. Used with stirring apparatus. **Each** **$1.60**

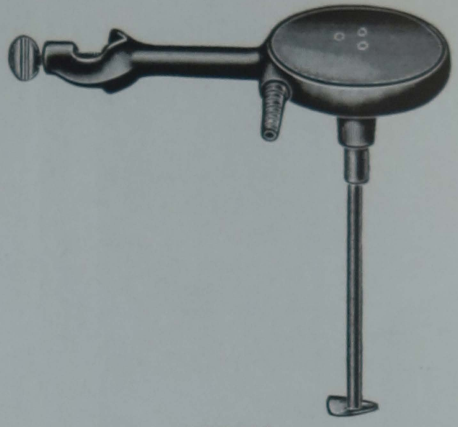
360M6 Stirring Rods, Glass. Used with stirring apparatus. **Each** **$1.00**



360M7

360M7 Stirrer Pulleys, Three Cone. Belt-driven. Cone diameters on the wood pulley are 1½, 2½ and 4 inches. The pulley shaft is split to hold stirrers 5 to 8 mm. in diameter, and revolves in a brass tube for attaching to a support rod by means of an ordinary clamp. Takes round belt 3/16 to ¼ inch in diameter. **Each** **$5.50**

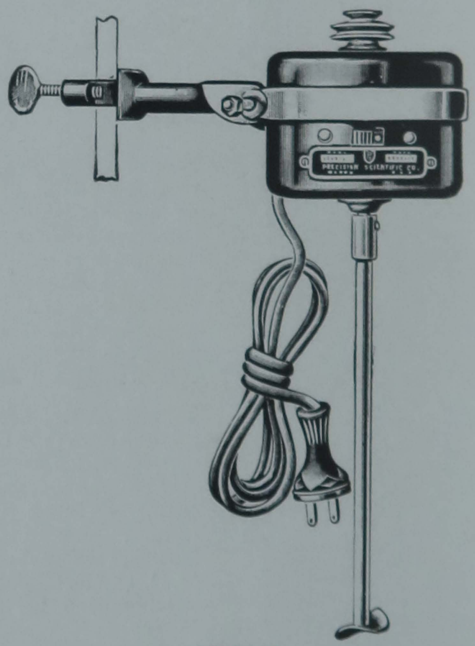
360M8 Stirrer Pulleys, Three Cone. Same as 360M7, except with aluminum pulley. **Each** **$6.50**



360M10

360M9 Stirrers, Air Driven, Aero-Mix. A silent, variable speed stirrer driven by compressed air. Operates on pressures as low as two pounds. Total height, 8 inches. Muff center to shaft, 4½ inches. Complete with muff to fit ½-inch rods; ¼-inch chuck and glass stirring rod. **Each** **$4.75**

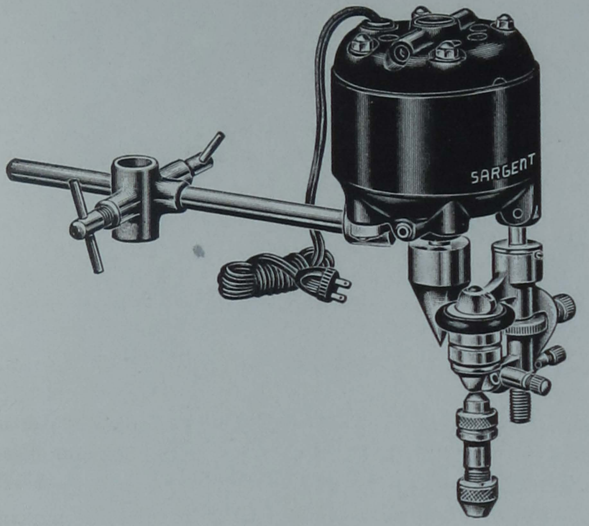
360M10 Stirrers, Air Driven, Aero-Mix. Same as 360M9 except with 6-inch Monel shaft and Monel propeller. **Each** **$4.75**



360M11

360M11 Stirrers, Laboratory, Electric, "Economy." Used for various laboratory stirring jobs. The stirring rod and propeller are made of Monel metal. Small, light in weight, easy to handle and safe because of its sparkless, brushless, induction motor. Its no-load speed is about 3000 R. P. M., but agitation effect can be reduced by flattening the propeller. Current consumption is approximately 70 watts. Dimensions: center of rod clamp to shaft center, 4½ inches; top of pulley to bottom of propeller shaft, 10 inches. Complete with constant speed high-torque brushless induction motor, balanced stirring rod, switch built into motor housing, two-step pulley, bronze bearings with wick-fed lubrication, clamp for rods up to ⅝ inches diameter, propeller, and rubber-covered cord and plug. For 110 volts, 50-60 cycle A. C. **Each** **$7.50**

Stirring Apparatus, Continued



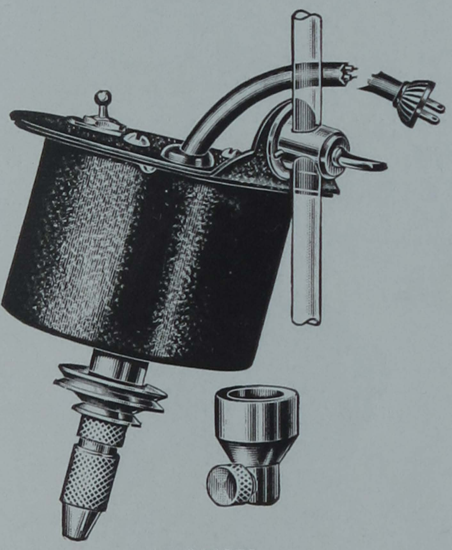
361M1

361M1 Stirrers, Electric, Cone Drive, Sargent. Variable speed. A constant speed motor with chuck shaft driven through a cone-to-ring device permitting continuous adjustment of speeds from 75 to 1300 R. P. M. and transmitting full motor power at all speeds. Speed adjustment is accomplished by turning a knurled nut which determines the diameter of cone in contact with the driven ring. The full work capacity of the motor is delivered at the chuck or pulley. Selection of speed can be made with an accuracy of plus or minus 10 R. P. M. The motor is equipped with a chromium-plated underslung support rod with an adjustable right angle clamp which attaches to ½ or ⅝-inch vertical support rods. This support allows adjustment of distance of shaft from support rod and also allows any angular position of motor shaft. The driven shaft carries pulleys for belt transmission and a chuck with two collets to take ¼-inch rods and 12-18 B. & S. gauge wire sizes respectively. Binding posts for line connections and a special screw clamp for cathodes are provided for convenience in carrying out electro-depositions with rotary anodes. Motor proper is finished in baked black enamel and all other parts are heavily chromium-plated. The cone is made of stainless steel; the friction ring of special synthetic composition; and the thrust bearings have stainless steel balls and races. Plain shaft bearings are provided with wick-packed oil holes requiring only infrequent attention. Complete with cross support rod and clamp holder, chuck with two collets, connecting cord and plug, but without stirring rods or support. For operation from 110 volts A. C., 60 cycle single phase circuits. **Each** **$30.00**

361M2 Stirrers, Electric Cone Drive, Sargent. Same as 361M1, except for 110 volts D. C. **Each** **$32.00**

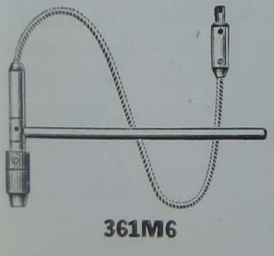
361M3 Stirrers, Electric Cone Drive, Sargent. Same as 361M1, except for 220 volts A. C. 60-cycle single phase. **Each** **$31.00**

361M4 Stirrers, Electric, Cone Drive, Sargent. Same as 361M1, except for 220 volts D. C. **Each** **$33.00**



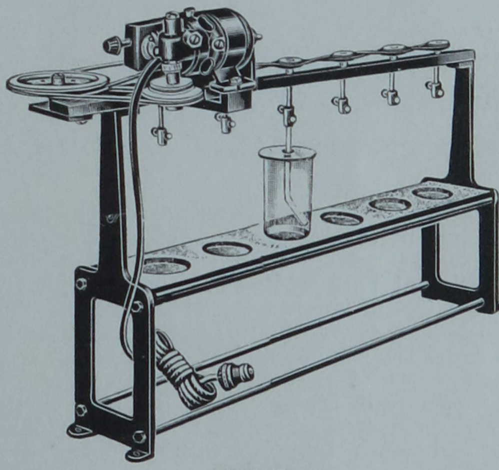
361M5

361M5 Stirrers, Electric, Low Speed. A slow-speed and high torque stirrer, without motor control, rheostat or adjustable drive. Draws only 15 watts; has a starting torque of 9/10 inch pounds; and runs at a speed from 115 R. P. M. under no load to 85 R. P. M. at full load. Consists of built-in reduction gears; universal clamp for mounting at any angle on an ordinary support rod; ⅛-inch removable chuck interchangeable with another ¼-inch chuck bearing a two-step drive pulley; and built-in "on-off" snap switch mounted on motor housing. Motor and built-in gears are fully enclosed in rugged metal housing 3½ inches in diameter and 2½ inches in depth. Finish is baked-on crystal black, corrosion-resistant. Complete with 6 feet of rubber-covered cord with plug. For 110 volts A. C. **Each** **$15.00**



361M6

361M6 Flexible Shafts. For out-of-the-way stirring jobs. Consists of mounting rod 6x⅜ inches; chuck for ¼-inch rods; flexible shaft 12 inches long with ¼-inch stud to fit 361M5 stirrer chucks. Made of dull nickeled brass. **Each** . . . **$4.00**



361M7

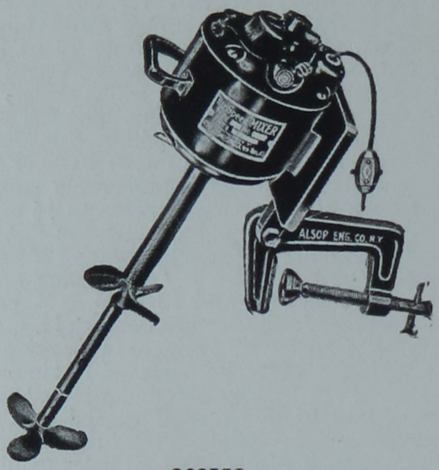
361M7 Stirring Apparatus, Blair, Electric. Six unit; motor driven. The shelf is a trough holding one sheet of asbestos strip over which is placed an asbestos strip with holes for six 400-ml. beakers. Equipped with a rheostat, which, with the belt changes possible, gives a range of stirrer speed of 40 to 135 R. P. M. Stirring shafts are equipped with set screws and collars for holding stirring rods. For 110 volts A. C. or D. C. **Each** **$70.00**

361M8 Stirring Apparatus, Blair, Electric. Same as 361M7, except for 220 volts A. C. or D. C. **Each** **$73.00**

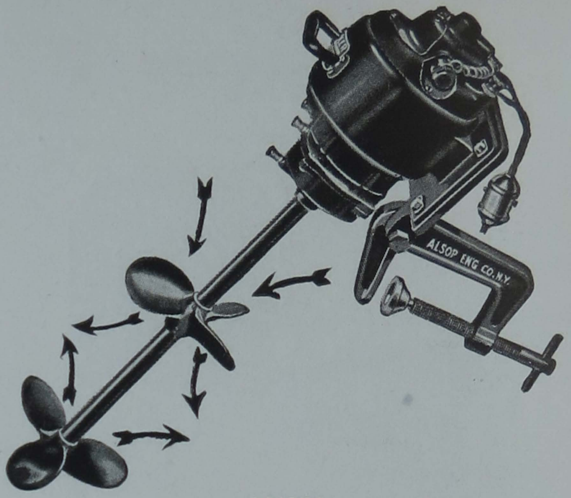
361M9 Stirring Apparatus, Blair, Electric. Same as 361M7, except arranged for speeds of 5 to 40 R. P. M. as used in experimental water and sewage treatment. **Each** **$75.00**

361M10 Stirring Apparatus, Blair. Without motor or rheostat. For belt drive. **Each** **$35.00**

Stirrers, Continued


ALSOP ENG. CO. N.Y.

362M2


ALSOP ENG. CO. N.Y.

362M6

362M1 Stirrers, Laboratory. Recommended for small batches of material, 10 to 15 gallons of thin free-flowing liquids. Consists of a direct-drive motor, $\frac{1}{20}$ H. P.; one 2-inch diameter, three-blade propeller, speed, 1725 R. P. M.; Monel metal stirring shaft, adjustable in length from 12 inches to approximately 20 inches and directly connected to the motor. Equipped with universal adjustable clamp for attaching to any container. For 110 volts, 60-cycle single phase current. Complete with cord and switch. Shipping weight, 20 pounds. **Each**........ **$40.00**

362M2 Stirrers, Medium Duty. Designed for mixing syrups, light chemicals, thin varnishes, and similar products in quantities up to 50 gallons or thin liquids up to 150 gallons. Includes a direct-drive motor, $\frac{1}{4}$ H. P.; two 4-inch diameter; three-blade propellers; speed, 1750 R. P. M.; Monel metal shaft, of length specified for container used, up to 40 inches. Equipped with universal adjustable clamp. For 110-volt, 60-cycle, single-phase current. Complete with cord and switch. Shipping weight, 60 pounds. **Each**........ **$48.00**

362M3 Stirrers, Medium Duty. Same as 362M2, except with vapor-proof motor. **Each**........ **$65.00**

362M4 Stirrers, Medium Duty. Same as 362M2, except with aluminum shaft. **Each**........ **$48.00**

362M5 Stirrers, Medium Duty. Same as 362M4, except with vapor-proof motor. **Each**........ **$65.00**

362M6 Stirrers, Slo-Speed Medium Duty. Recommended for heavy liquids in tanks up to 50 gallons, for lighter liquids up to 200 gallons, or thin liquids up to 1000 gallons. With a $\frac{1}{4}$ H. P. motor of the open splash-proof type operating at 1725 R. P. M. on ball bearings. This speed is reduced through machine-cut gears to approximately 440 R. P. M. at the propeller shaft, which shaft operates on Timken tapered roller bearings. The shaft is Monel metal and can be supplied in any length specified up to 72 inches, and is equipped with two three-blade, 7-inch diameter, adjustable propellers. The gears operate in an oil bath in a totally enclosed housing. Outfit is equipped with universal adjustable clamp for attaching to container. Fitted with cord and switch. Complete with standard type motor for 110 or 220-volt, single or three-phase, 60-cycle current or direct current. When ordering specify current characteristics. Shipping weight, 85 pounds. **Each**. **$95.00**

362M7 Stirrers, Slo-Speed Medium Duty. Same as 362M6, except with vapor-proof motor. **Each**........ **$115.00**

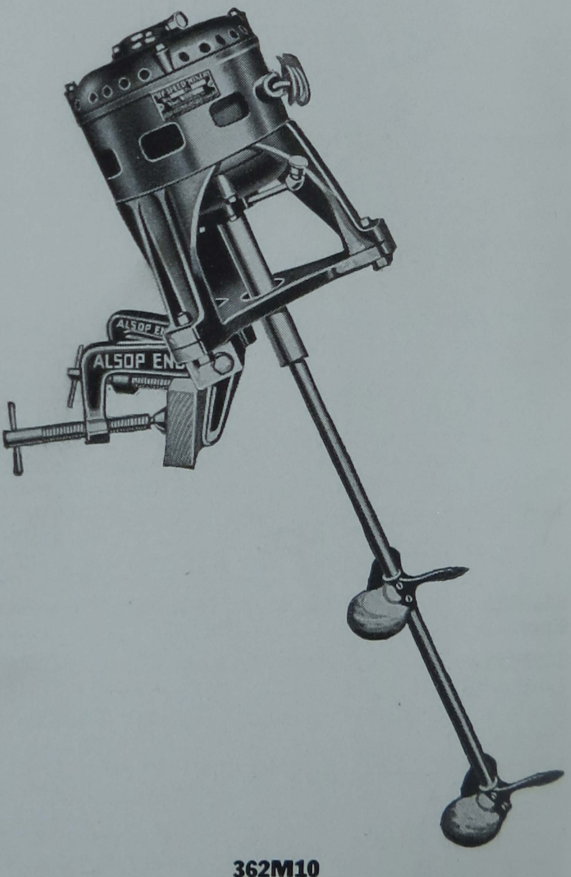
362M8 Stirrers, Slo-Speed Medium Duty. Same as 362M6, except with aluminum shaft. **Each**........ **$95.00**

362M9 Stirrers, Slo-Speed Medium Duty. Same as 362M8, except with vapor-proof motor. **Each**........ **$115.00**

362M10 Stirrers, Hy-Speed. For continuous circulation or mild agitation of large batches of thin liquid. Equipped with 1 H. P. direct-drive motor with two three-blade, 6-inch diameter adjustable propellers, speed, 1150 R. P. M. Apparatus has a universal adjustable clamp for attaching to container. Furnished complete with cord and switch for operation on 110 or 220 volt, single or three phase 60 cycle or direct current. When ordering specify current characteristics. Shipping weight, 180 pounds. **Each**........ **$190.00**

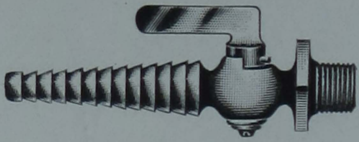
362M11 Stirrers, Hy-Speed. Same as 362M10, except with vapor-proof motor. **Each**........ **$210.00**

362M12 Stirrers, Motor Driven. For special conditions. Either direct- or gear-drive with motors $\frac{1}{16}$ H. P. to 10 H. P. can be supplied. Prices and information upon request.

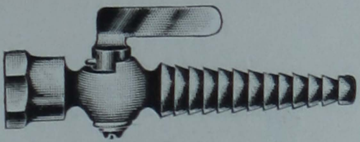


362M10

Stopcocks



363M1

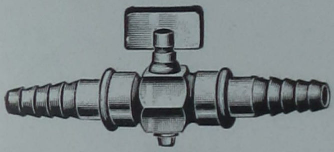


363M2

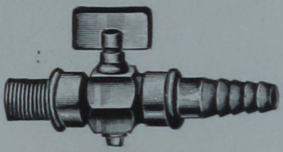
363M1 Stopcocks, Brass, Nickel Plated. With male threads. Designed for laboratory duty in handling water, gas, or compressed air. Serrated hose connections, 2½ inches long, connect to rubber tubing from ¼ inch to ½ inch, inside diameter. Tested to 35 pounds pressure. Valves act through 180°. Hexagonal wrench seats. Diameter of bore, 5/32 inch.

Iron pipe size, inches	¼	⅜
Each	**$1.10**	**1.10**

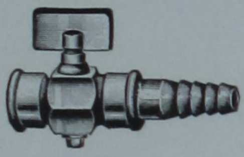
363M2 Stopcocks, Brass, Nickel Plated. With female threads. Otherwise same as 363M1. **Each** **$1.10** **1.10**



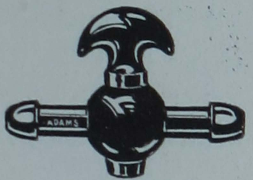
363M3



363M4



363M5



363M6

Stopcocks, Brass. With bronze plugs. For gas, water or air at pressures up to 35 pounds. ⅛-inch bore stopcocks take ¼ or 5/16-inch I. D. tubing; ¼-inch bore stopcocks take 5/16 or ⅜-inch I. D. tubing.

363M3 Stopcocks, Brass. Both ends with nipples for tubing.

Bore, inches	⅛	¼
Each	**$ .75**	**.90**

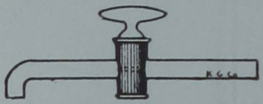
363M4 Stopcocks, Brass. With nipple and with ⅛-inch I. P. S. male thread.

Bore, inches	⅛	¼
Each	**$ .60**	**.70**

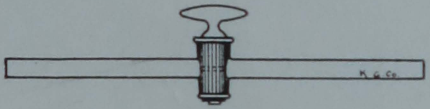
363M5 Stopcocks, Brass. With nipple and with ⅛-inch I. P. S. female thread.

Bore, inches	⅛	¼
Each	**$ .75**	**.90**

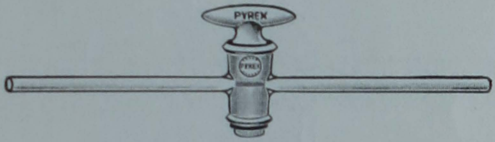
363M6 Stopcocks, Hard Rubber. Bore, ⅛-inch. **Each** .... **$ .50**



363M7



363M8



363M9

363M7 Stopcocks, Straight Bore, Glass. With the end of one stem bent.

Bore of plug, mm	2	3	4
Each	**$ .90**	**1.05**	**1.05**
Case of 12	**$9.72**	**11.34**	**11.34**

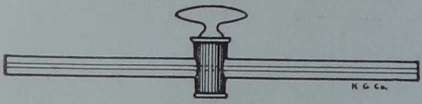
363M8 Stopcocks, Straight Bore, Glass. With straight stems.

Bore of plug, mm	1	2	3	4	5	6	8	10
Each	**$ .80**	**.80**	**.95**	**.95**	**1.25**	**1.25**	**1.70**	**2.00**
Case of 12	**$8.64**	**8.64**	**10.26**	**10.26**	**13.50**	**13.50**	**18.36**	**21.60**

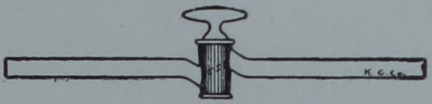
363M9 Stopcocks, Straight Bore, Glass, Pyrex. With straight stems and interchangeable ₮ plug.

Bore of plug, mm.	**1**	**2**	**3**	**4**	**6**	**8**	**10**	**15***
Stopcock plug, ₮ number	1	2	3	4	6	8	10	....
Quantity in case	12	12	12	12	6	6	6	2
Each	**$ 1.65**	**1.80**	**2.00**	**2.40**	**3.20**	**4.00**	**5.00**	**12.00**
Case	**$17.82**	**19.44**	**21.60**	**25.92**	**17.28**	**21.60**	**27.00**	**21.60**

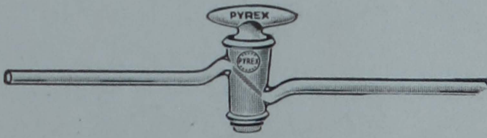
*Not covered by ₮ specifications, but ground to a 1:10 taper.



363M10



363M11



363M12

363M10 Stopcocks, Capillary, Straight Bore, Glass. With straight stems made of capillary tubing, bore, 1½ mm.
Each, $ .90. Case of 12 .... **$9.72**

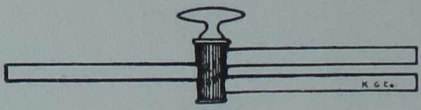
363M11 Stopcocks, Oblique Bore, Glass. With straight stems offset where sealed to the barrel.

Bore of plug, mm	2	4
Each	**$ 1.00**	**1.15**
Case of 12	**$10.80**	**12.42**

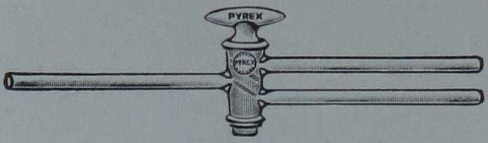
363M12 Stopcocks, Oblique Bore, Glass, Pyrex. With straight stems offset where sealed to the barrel.

Bore of plug, mm.	**1**	**2**	**3**	**4**	**6**	**8**	**10**	**15**
Quantity in case	12	12	12	12	6	6	6	2
Each	**$ 1.90**	**2.10**	**2.30**	**2.70**	**3.70**	**4.70**	**5.60**	**13.20**
Case	**$20.52**	**22.68**	**24.84**	**29.16**	**19.98**	**25.38**	**30.24**	**23.76**

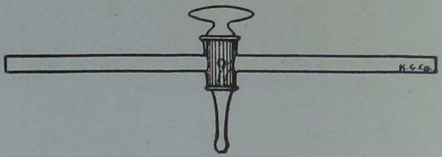
Stopcocks, Continued



364M1



264M2



364M3

364M1 Stopcocks, Three-way, Glass. With two stems on one side, one on the opposite side.

Bore of plug, mm	2	4
Each	$ 1.25	1.60
Case of 12	$13.50	17.28

364M2 Stopcocks, Three-way, Glass, Pyrex. With two stems on one side, one on the opposite side.

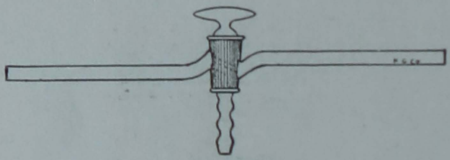
Bore of plug, mm	1	2	3	4
Each	$ 2.60	2.80	3.00	3.40
Case of 12	$28.08	30.24	32.40	36.72

364M3 Stopcocks, Three-way, Glass. With straight stems and with an outlet through the small end of the plug.

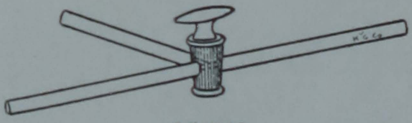
Bore of plug, mm	2	4
Each	$ 1.50	1.80
Case of 12	$16.20	19.44

364M4 Stopcocks, Three-way, Glass, Pyrex. Same as 364M3, except Pyrex glass.

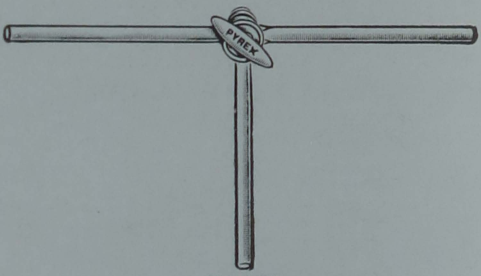
Bore of plug, mm	1	2	3	4
Each	$ 2.40	2.55	2.75	3.15
Case of 12	$25.92	27.54	29.70	34.02



364M5



364M6



364M7

364M5 Stopcocks, Three-way, Glass. With straight stems offset where sealed to the barrel, and with an outlet through the small end of the plug.

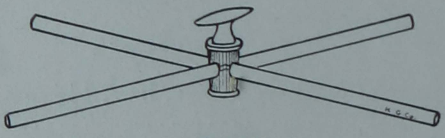
Bore of plug, mm	2	4
Each	$ 1.65	1.90
Case of 12	$17.82	20.52

364M6 Stopcocks, Three-way, "T" Bore, Glass. With three stems in the same plane. Any two stems, or all three, can be connected at one time.

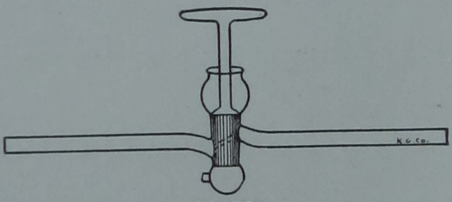
Bore of plug, mm	4	4
Each	$ 1.40	1.65
Case of 12	$15.12	17.82

364M7 Stopcocks, Three-way, "T" Bore, Glass, Pyrex. Same as 364M6, except Pyrex glass.

Bore of plug, mm	1	2	3	4
Each	$ 2.00	2.20	2.40	2.80
Case of 12	$21.60	23.76	25.92	30.24



364M8

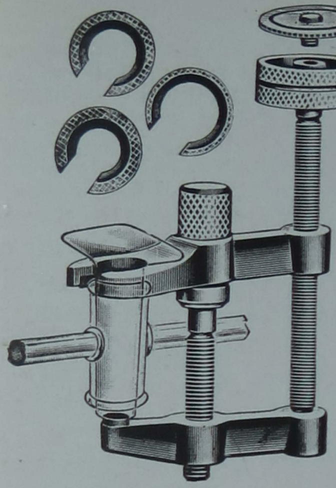


364M9

364M8 Stopcocks, Four-way, Glass. With four stems in the same plane. Any two stems can be connected at one time.

Bore of plug, mm	2	4
Each	$ 1.65	2.15
Case of 12	$17.82	23.22

364M9 Stopcocks, Mercury Seal, Oblique Bore, Glass. With straight stems offset where sealed to the barrel. Bore, 2mm.
Each, $3.00. Case of 6 .... **$16.20**


365M1

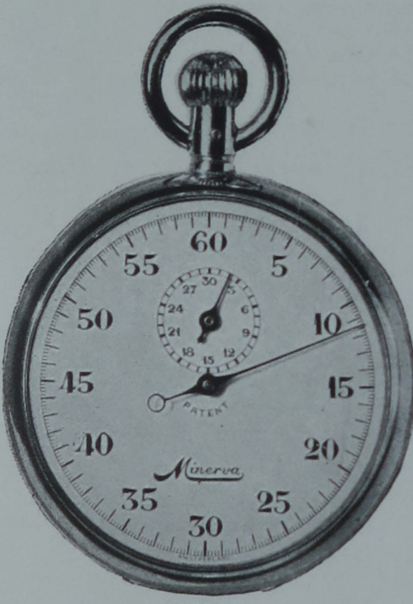
365M1 Stopcock Plug Removers. Constructed of aluminum and bronze. May be used on stopcocks sealed into apparatus set-ups as it requires a space only 1½ inches wide.

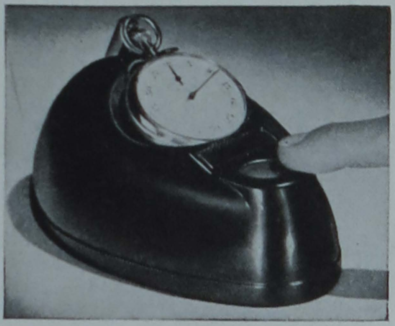
A fibre plug bears against the lower tip of the frozen stopcock plug while any one of four interchangeable Bakelite jaw collars bears against the top of the stopcock barrel. The center screw adjusts the clamp to the height of the stopcock. By turning the end screw clock-wise, the clamp jaws draw together and force the plug up and out of the barrel. Maximum clamp opening between fibre tip and jaw collars is 2½ inches. The extra jaw collars not in use are retained by a removable screw cap in the hollow head of the end clamp-screw. Complete with four interchangeable Bakelite jaw collars. **Each**.................................. **$7.50**

365M2 Jaw Collars, Interchangeable, Bakelite. For 365M1.

Diameter, inches..................................	7/16	9/16	11/16	13/16
Each..................................	**$ .50**	**.50**	**.50**	**.50**

Stop-Watches


365M4


365M6

365M3 Stop-Watches. ⅕ Second. 30-minute small dial and 60-second large dial divided in ⅕ seconds. Jeweled movement with nickel case. Start, stop and return to zero by successive depressions of crown. **Each**.............................. **$8.00**

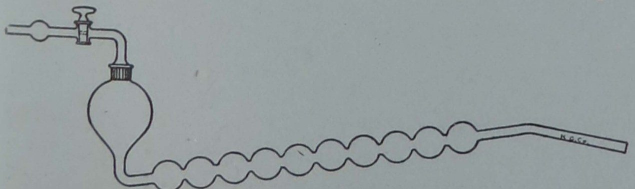
365M4 Stop-Watches. ⅕ Second. 30-minute small dial and 60-second large dial in ⅕ seconds. High grade, 7 jeweled movement with nickel case. Start, stop, and return to zero by successive depressions of crown. **Each**........................ **$12.50**

365M5 Stop-Watches. 1/10 Second. Same as 365M4, except 60-second dial divided into 1/10 seconds. **Each**............. **$12.50**

Note: For stop-watches other than those listed above, see page 285.
Note: For stop-watches for oil viscosimeters, see page 285.

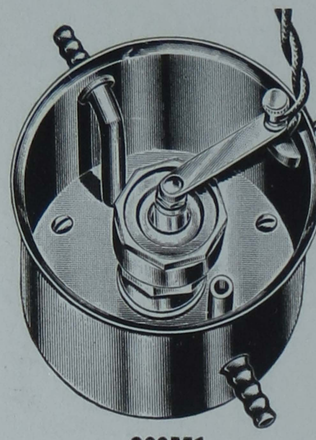
365M6 Stop-Watch Holders. Moulded construction. Adjusts for watches of different sizes and has an adjustable stop to suit different stem movements. Watch is quickly inserted or removed; and pressure on the crown to start, stop or return to zero is applied by pressing a button. **Each**.. **$2.95**

Sulphur Apparatus


365M7

365M7 Sulphur Apparatus, Meyer. With ten bulbs, and ground-in connecting tube with stopcock. **Each**.................... **$ 4.00**
Case of 6.. **$21.60**

Sulphur Apparatus, Continued



366M1

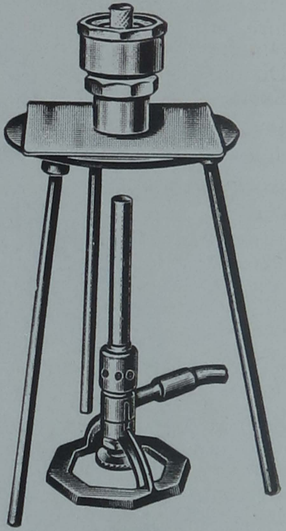
366M1 Sulphur Bombs, Electric Ignition, Parr. A. S. T. M. D-271. For the determination of sulphur, the halogens, phosphorous and similar elements by oxidation with molten sodium peroxide in a closed vessel. The apparatus consists of a bomb, white nickel finished brass water bath with two binding posts for attaching the lead wires, ignition unit and set of accessories for operation. The bomb is composed of a 30% nickel steel, ⅝-inch cup of 22 ml. capacity suspended in a chromium plated brass bell body with an air gap around the sides and bottom; a chromium plated brass cover sealed by a rubber gasket with insulated fuse wire electrodes of special alloy; a chromium plated brass screw cap; and floating bottom. The ignition unit for firing the charge takes current directly from the line. Complete with ignition unit, bomb, extra cup, two cup covers, wrench and bench socket, water bath, peroxide dipper, fuse wire, extra gaskets, mixing rod and direction booklet. For 110 volts. **Each**........$56.00

366M2 Sulphur Bombs, Electric Ignition, Parr. For 220 volts. Otherwise, same as 366M1. **Each**........$58.00

Parts for 366M1 and 366M2 Sulphur Bombs

366M3 Sulphur Bomb. Complete. **Each**	$17.75
366M4 Water Bath. Complete. **Each**	$10.10
366M5 Ignition Unit, 110 Volt. **Each**	$16.00
366M6 Ignition Unit, 220-Volt. **Each**	$18.00
366M7 Peroxide Dipper. Each	$ 1.00
366M8 Card Fuse Wire. 350 pieces, 7 cm. long. **Each**	$ .60

366M9 Sulphur Bombs, Flame Ignition, Parr. A. S. T. M. D-271. Consists of a closed vessel or bomb for the combustion of the sample, an ignition housing for starting the combustion, and a set of accessories for operation. The bomb is composed of four parts: cup, body, cover and screw cap. The cup and screw cap are identical with those of the electric ignition bomb. The chromium plated brass body is a short cylinder with screw threads at the top. It is cut off below the octagonal part so that the lower half of the cup is exposed. The cover is of chromium plated brass with a knurled knob. It is recessed into the cup for protection of the rubber gasket. The cover and cup are clamped together by the screw cap, using the wrench and bench socket provided for this purpose. The ignition housing is a steel shell having a bottom plate recessed in the center to receive the bomb, and in the recess a hole which exposes the bottom of the fusion cup. Thus, a flame directed through the hole will produce a hot spot on the bottom of the cup without over-heating the wall and upper parts of the bomb. Ignition is secured in this manner. Complete with bomb, extra cup, cup cover, wrench and bench socket, peroxide dipper, ignition housing, extra gaskets, mixing rod and direction booklet, but without support, support plate and burner. **Each**........$27.00



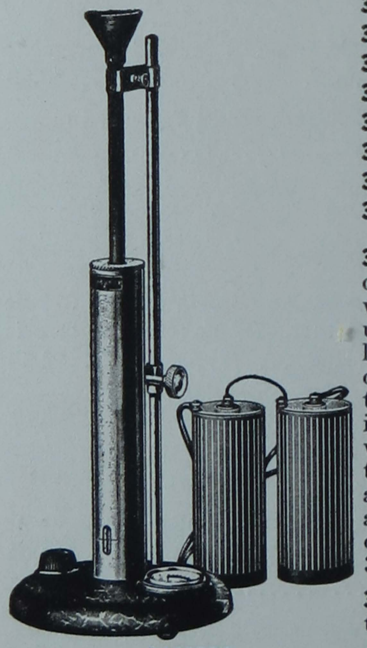
366M9

Parts for 366M9 Sulphur Bombs

366M10 Sulphur Bomb. Complete. **Each**	$13.10
366M11 Ignition Housing. Complete. **Each**	$ 3.65
366M12 Peroxide Dipper. Each	$ 1.00

Parts for 366M1, 366M2 and 366M9 Sulphur Bombs

366M13 Fusion Cup. Each	$5.00
366M14 Cup Cover. Each	$1.30
366M15 Wrench. Each	$1.30
366M16 Bench Socket. Each	$1.10
366M17 Rubber Gaskets. Dozen	$ .35
366M18 Mixing Rods. Each	$ .20
366M19 Sodium Peroxide. Sulphur-free. In hermetically sealed ½-pound tins. **Tin**	$ .75
366M20 Potassium Perchlorate. Sulphur-free. In three-ounce bottle. **Each**	$ .70
366M21 Benzoic Acid. Pure sublimed crystals. In one-ounce bottles. **Ounce**	$ .60



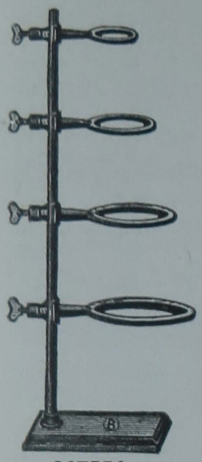
366M22

366M22 Sulphur Turbidimeters, Parr. For the rapid estimation of sulphur or sulphates in coal, coke, oils, boiler water, portland cement, rubber, etc. Can be used with any substance in which the sulphur is convertible readily to the form of a soluble sulphate. Not recommended for use with solids or oils containing less than 0.26% sulphur by weight, or with waters containing less than one hundred parts per million of sodium sulphate. Consists of a Bakelite tube having an optical glass bottom, in which the test solution is placed; a plunger tube of hard rubber by which the effective depth of solution is measured; a gear, rack and telescope tube mechanism for adjusting the position of the plunger; an eye-tube and soft rubber eye-piece; a lacquered metal base in which is mounted the electric filament lamp on which the eye is focused, a rheostat for controlling the filament voltage, and a voltmeter for indicating the voltage used. Three dry cell batteries are included with the instrument to provide the current for the filament. Its accuracy is comparable to that of the gravimetric method, and in addition, it possesses the great advantage of speed, determinations being possible in a few minutes. Complete with batteries for D. C. operation, 3 ounces of special barium chloride and measuring dipper. **Each**........$45.00

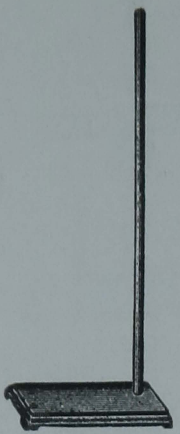
366M23 Sulphur Turbidimeters, Parr. Same as 366M22, except with special voltmeter and transformer for 110-volt A. C. **Each**........$50.00

366M24 Barium Chloride, Special. 3-Ounce Bottle........$ .60

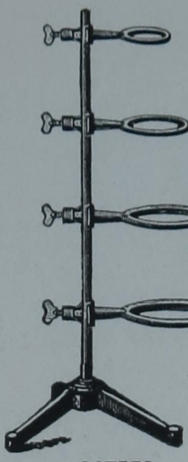
Supports



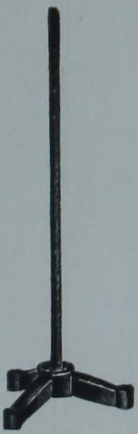
367M1



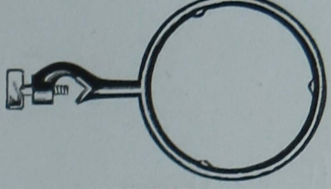
367M2



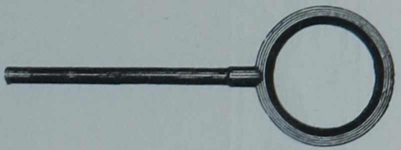
367M3



367M4



367M5



367M6

367M1 Supports, Rectangular Base. Black Japanned iron bases with rings and copper-plated steel rods.

Size	**Small**	**Medium**	**Large**	**Extra Large**
Size, base, inches	4x6	5x8	6x9	6x11
Size, rod, inches	18x⅜	20x⅜	24x½	36x½
Number of rings	2	3	4	4
Diameter, rings, inches	2, 3	2, 3, 4	2, 3, 4, 5	3, 4, 5, 6
Each	**$ .88**	**1.20**	**1.60**	**2.27**

367M2 Supports, Rectangular Base. Same as 367M1, except without rings.

Each	**$ .50**	**.60**	**.75**	**1.25**

367M3 Supports, Triangular Base. Black Japanned iron bases with rings and copper-plated steel rods.

Size	**Small**	**Medium**	**Large**	**Extra Large**
Leg of base, inches	3	4	5	6½
Size, rod, inches	18x⅜	20x⅜	24x½	36x½
Number of rings	2	3	4	4
Diameter, rings, inches	2, 3	2, 3, 4	2, 3, 4, 5	3, 4, 5, 6
Each	**$ .88**	**1.20**	**1.85**	**2.52**

367M4 Supports, Triangular Base. Same as 367M3, except without rings.

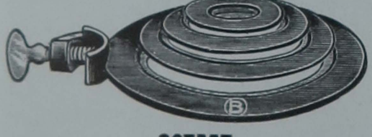
Each	**$ .50**	**.60**	**1.00**	**1.50**

367M5 Support Rings, with Clamp. Cast iron. Muff takes rods up to ½ inch. Projections on inside provide three-point support. Shanks of successive rings vary in length so that all rings are concentric. Distance from muff centers to ring centers is 4½ inches. Baked-on japan finish. Forged brass thumb screw.

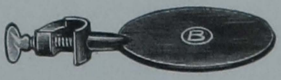
Nominal size, inches	**2**	**3**	**4**	**5**	**6**
Diameter, inside, inches	1⅞	2⅜	3¼	4¼	5¼
Each	**$ .16**	**.18**	**.25**	**.30**	**.35**

367M6 Support Rings, Extension. Cast iron. Projections on inside provide three point support. Baked-on japan finish.

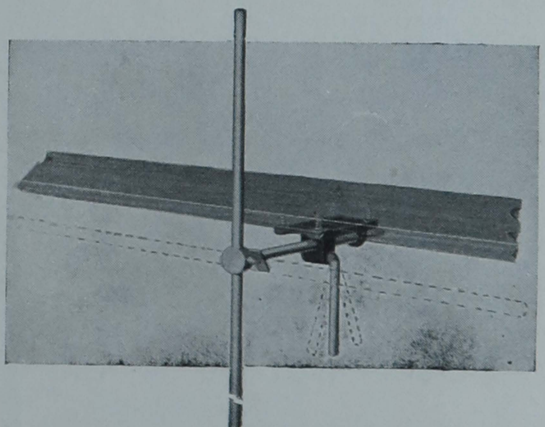
Nominal size, inches	**2**	**3**	**4**	**5**	**6**
Diameter, inside, inches	2⅛	3¼	4¼	5⅝	5 13/16
Stem, inches	8	7½	7	6⅜	6¾
Each	**$ .15**	**.18**	**.20**	**.25**	**.28**



367M7



367M8



367M9

367M7 Support Rings, Concentric, with Clamp. Set of four. Made of cast iron, japanned black, with screw clamp on largest ring for attaching to upright support. Largest ring has an outside diameter of 8 inches. **Each** **$1.40**

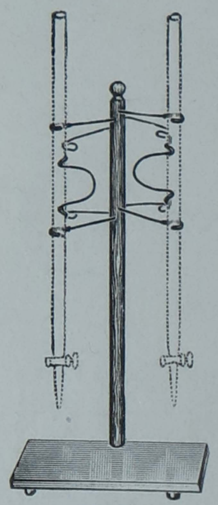
367M8 Support Tables. May be used as a hot plate over a gas burner, or as a support for beakers, dishes, etc. Muff takes rods up to ⅝ inches. Cast iron, with raised rim to prevent objects from slipping off. Baked-on japan finish. Forged brass thumb screw. Diameter, 4¾ inches. **Each** .... **$ .60**

367M9 Supports, Universal, Farmer's. Bracket is made of cast iron; rod, of cold rolled steel. Support can be adjusted to any position by a brass thumb screw and can be rotated through a 360° angle.

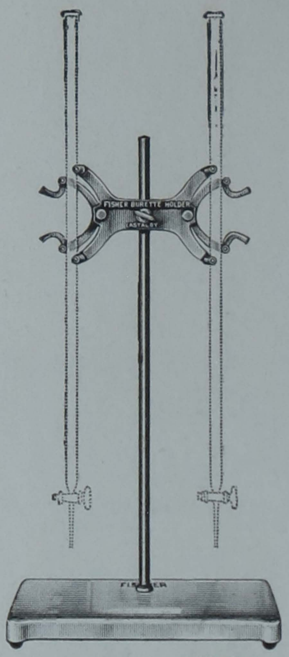
Length, apparatus rod, inches	**20**	**36**
Length, bracket rod, inches	12	20
Each	**$1.50**	**2.00**

367M10 Supports, Universal, Farmer's. Same as 367M9, except made of stainless steel. **Each** **$3.50** **4.50**

Supports, Continued



368M1



368M3

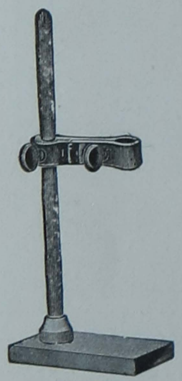
368M1 Supports, Burette, Chaddock's. For two burettes. Rubber cushioned, heavy brass spring clamps are self-closing, instantly opened by relieving the spring tension. Clamps are permanently fastened to the varnished hardwood rods, and hold the burettes perpendicular to the bases.

Varnished hardwood bases are faced with plates of thick white opalite glass held in place by fibre cleats. Support rods are rigidly held by large brass washer and wood screws, and bases rest on rubber pads. Complete with wood base 8x13½ inches faced with opal plate 5¾x12 inches. **Each**.....**$2.85**

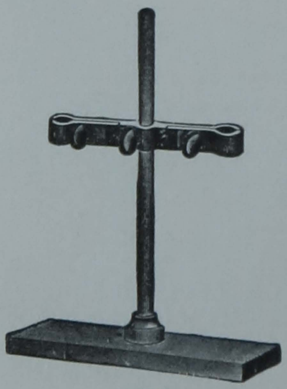
368M2 Supports, Burette, Chaddock's. Same as 368M1, except for one burette. **Each**.......................**$2.25**

368M3 Supports, Burette, with Castaloy Clamp. Base is of thick opal white glass 13x7 inches with support rod heavily nickel plated. Clamp is of corrosion-resistant metal and holds two burettes rigidly vertical by individual gripping mechanisms. Burettes are easily adjusted or removed and graduations are not obscured. **Each**................**$5.00**

368M4 Clamps, Only. For two burettes. **Each**......**$2.00**



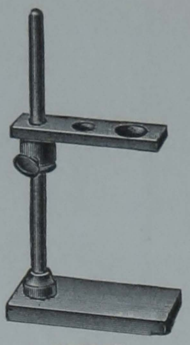
368M5



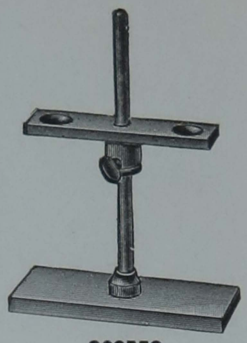
368M6

368M5 Supports, Burette, Wood. With adjustable cork-lined clamp for one burette. **Each**..................**$1.30**

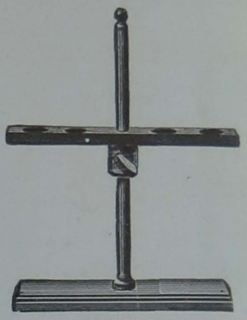
368M6 Supports, Burette, Wood. With adjustable cork-lined clamps for two burettes. **Each**.................**$1.40**



368M7



368M8

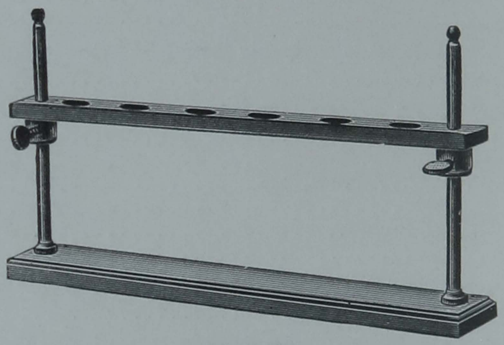


368M9

368M7 Supports, Funnel, Wood. With adjustable single arm for two funnels. **Each**..........................**$1.00**

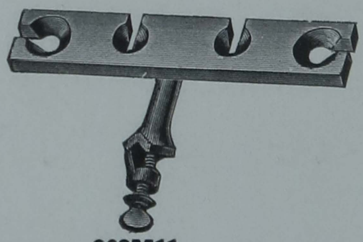
368M8 Supports, Funnel, Wood. With adjustable double arm for two funnels. **Each**..........................**$1.10**

368M9 Supports, Funnel, Wood. With adjustable double arm for four funnels. **Each**.........................**$1.20**



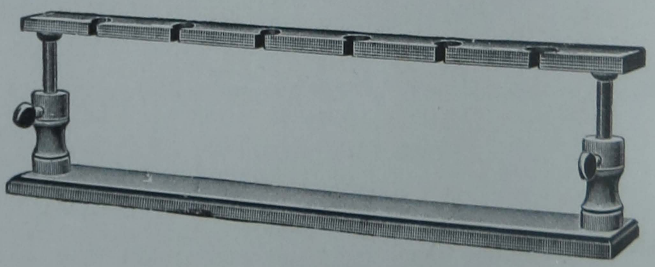
368M10

368M10 Supports, Funnel, Wood. Adjustable. For six funnels in one row. **Each**.............................**$3.50**



368M11

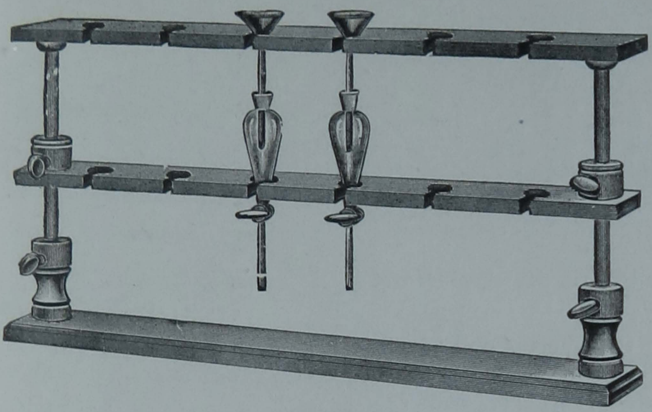
368M11 Supports, Funnel, Wood. With slotted holes for four funnels. With metal clamp for attaching to support. **Each**..**$ .60**



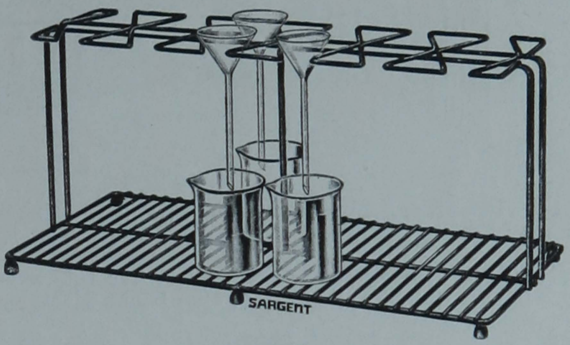
368M12

368M12 Supports, Funnel, Wood. Adjustable. With slotted holes for six funnels in one row. **Each**............**$4.00**

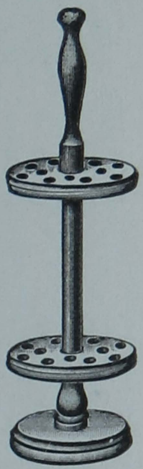
Supports, Continued



369M1



369M2

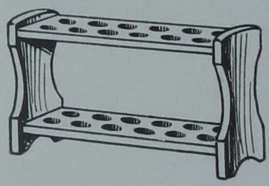


369M3

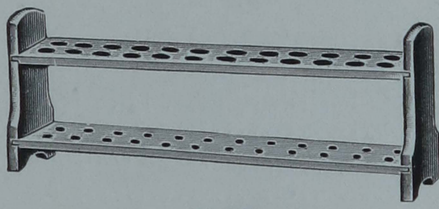
369M1 Supports, Separatory Funnel, Wood. With slotted holes. Adjustable lower arm. **Each** **$5.00**

369M2 Supports, Funnel, Rubber-plated Steel. Accommodates twelve funnels. Fixed height. The height of the shelf is such that the 150 mm. stem of an analytical funnel extends to a suitable depth into beakers of 250 ml. to 600 ml. capacity. Accommodates funnels of 50 to 75 mm. diameters arranged in a double row and the wide base accommodates twelve beakers of 250 to 600 ml. capacity. Structure of the support is entirely of welded steel and is completely coated with a thick layer of pure latex rubber. Length, 25 inches; height, 11¼ inches; width, 10½ inches; weight, 3 pounds. **Each** **$2.75**

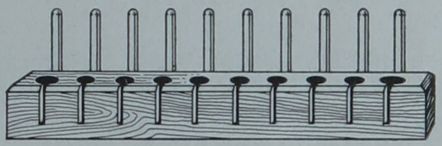
369M3 Supports, Pipette, Revolving. Made of wood. Accommodates twelve pipettes. **Each** **$3.00**



369M4



369M6



369M7

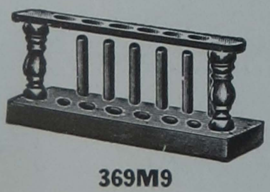
369M4 Supports, Test Tube, Wood. For twelve tubes. Holes are ⅞ inches in diameter. **Each** .... **$ .55**

369M5 Supports, Test Tube, Wood. Same as 369M4, except holes are 1⅛ inches in diameter. **Each** .... **$ .65**

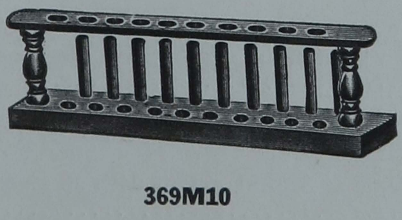
369M6 Supports, Test Tube, Wood. For twenty-four tubes. Holes are ¾ inch in diameter. **Each** .... **$ .80**

369M7 Supports, Test Tube, Wood. For ten tubes. With ten drying pins. Eight holes are ⅞ inch in diameter and two holes are one inch in diameter. Holes are slotted for viewing precipitates. **Each** .... **$ .70**

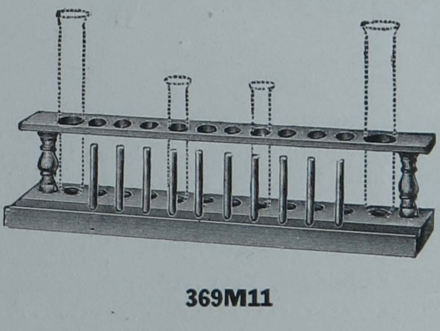
369M8 Supports, Test Tube, Wood. Same as 369M7, except for six tubes. With six drying pins. Holes are ⅞ inch in diameter and are slotted for viewing precipitates. **Each** .... **$ .55**



369M9



369M10



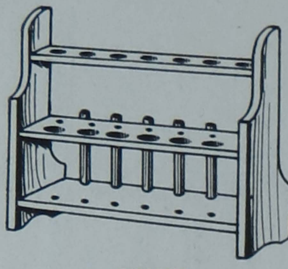
369M11

369M9 Supports, Test Tube, Wood. For six tubes. With six drying pins. Holes are 15⁄16 inch in diameter. **Each** ...... **$ .35**

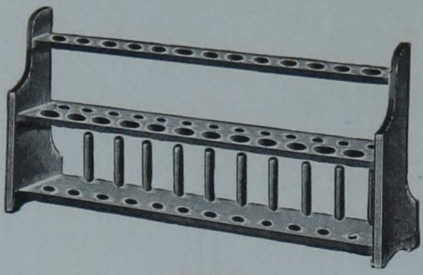
369M10 Supports, Test Tube, Wood. For ten tubes. With ten drying pins. Holes are 15⁄16 inch in diameter. **Each** ...... **$ .50**

369M11 Supports, Test Tube, Wood. For twelve tubes. With ten drying pins. Ten holes are ¾ inch in diameter and two holes are one inch in diameter. Base has groove for holding stirring rods, pipettes, etc. **Each** .... **$ .60**

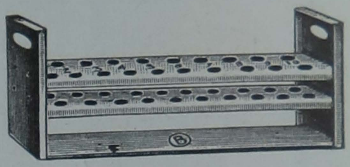
Supports Continued



370M1



370M2

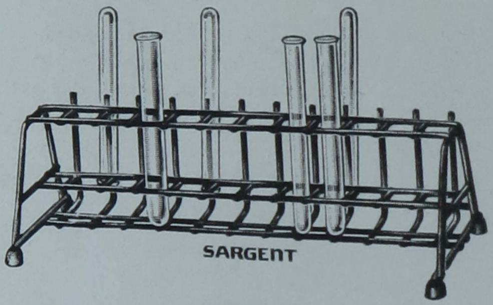


370M3

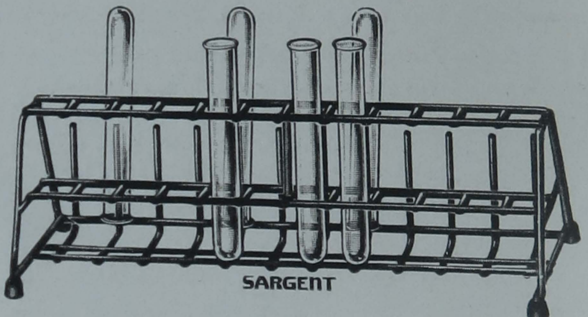
370M1 Supports, Test Tube. For thirteen tubes. With two shelves and six drying pins; top shelf has seven 13/16-inch diameter holes and lower shelf has six 1-inch diameter holes. **Each** . . . . **$ .75**

370M2 Supports, Test Tube, Wood. For twenty-five tubes. With two shelves and ten drying pins. Top shelf has thirteen 13/16-inch diameter holes and lower shelf has twelve 1-inch diameter holes. **Each** **$1.10**

370M3 Supports, Test Tube, Metal, Wasserman. Army medical model. For twenty 4x½-inch tubes in two rows of ten holes each, numbered in pairs from 1 to 10. The two perforated shelves hold the tubes vertically and prevent them from sliding. Made of heavy polished sheet copper. Length, 10 inches; width, 2 inches; height, 4 inches. **Each** **$2.00**



370M4



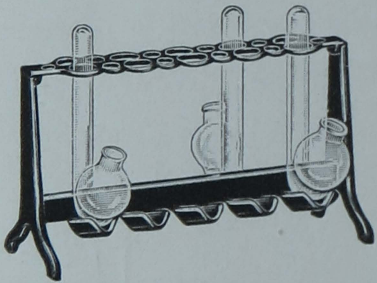
370M6

370M4 Supports, Test Tubes, Rubber-plated Steel. For twelve tubes ½ to ¾-inch diameter. With twelve drying pins. Length, 14 inches; width, 5¼ inches. **Each** **$1.25**

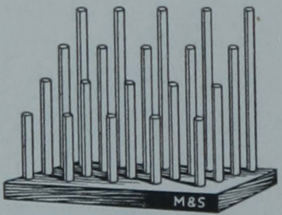
370M5 Supports, Test Tube, Rubber-plated Steel. Same as 370M4, except is 6¼ inches wide and accommodates twenty-four tubes. With twelve drying pins. **Each** **$1.50**

370M6 Supports, Test Tube, Rubbed-plated Steel. Fot twelve tubes ¾ to 1 inch in diameter. With twelve drying pins. Length, 17 inches; width, 5¼ inches. **Each** **$1.40**

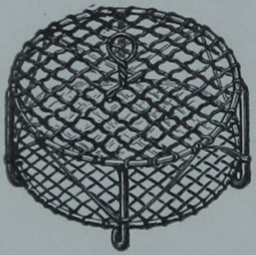
370M7 Supports, Test Tube, Rubber-plated Steel. Same as 370M6, except is 6¾ inches wide and accommodates twenty-four tubes. With twelve drying pins. **Each** **$1.75**



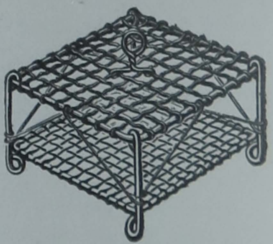
370M8



370M9



370M11



370M12

370M8 Supports, Fermentation Tubes. Japanned iron. The top has ten ¾-inch diameter openings and ten ⅜-inch diameter openings. Ten individual troughs at the bottom, each with a drain hole, support the glassware. Height, 5⅝ inches; length, 9⅝ inches; width, 4 inches. **Each** **$2.25**

370M9 Supports, Test Tube, Draining, Wood. For supporting twenty-five tubes in the inverted position for draining and drying; with pins in rows of successively increasing height from 2 to 5¾ inches. Size of base, 7x7 inches. **Each** **$1.50**

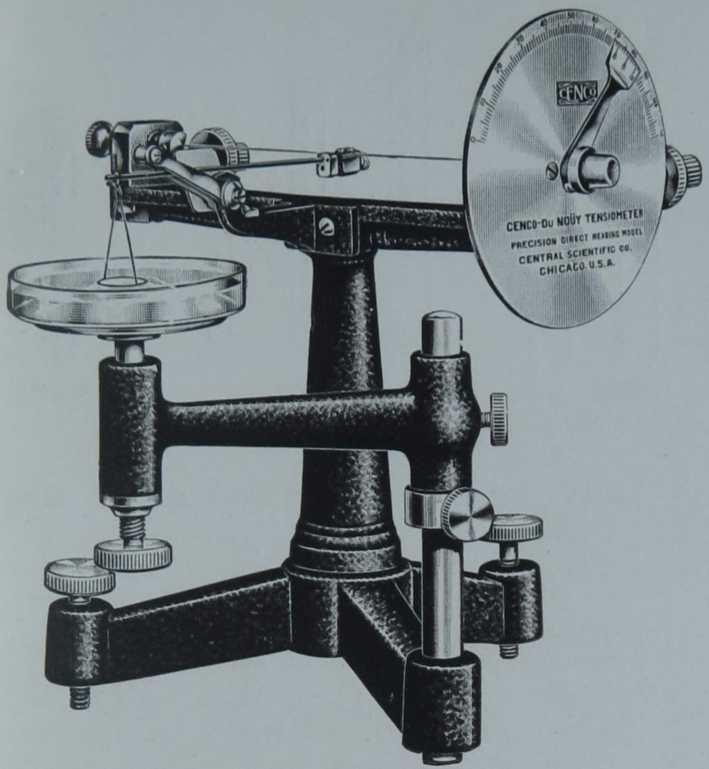
370M10 Supports, Test Tube, Draining, Wood. Same as 370M9, except with 50 pins. Size of base, 7x12½ inches. **Each** **$2.00**

370M11 Supports, Test Tube, Wire. Cadmium plated. With forty-eight 1 1/16-inch openings. Dimensions: diameter, 10 inches; height, 3½ inches. **Each** **$1.00**

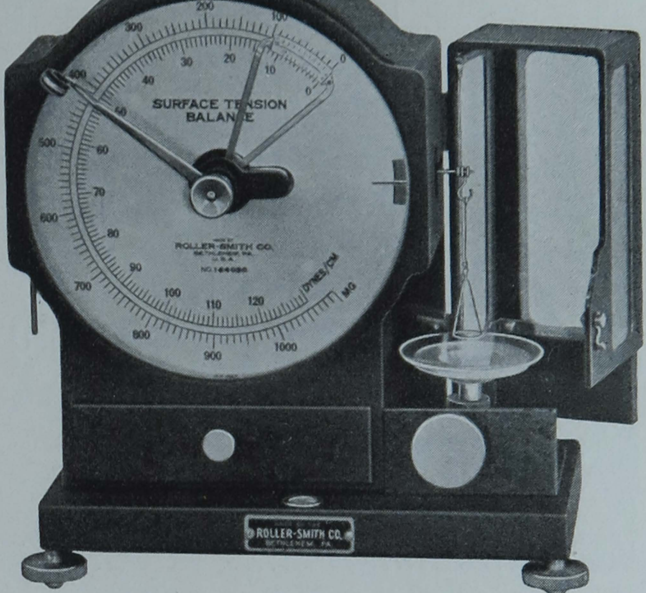
370M12 Supports, Test Tube, Wire. Cadmium plated. With forty-eight 1 1/16-inch openings. Dimensions: 8¼x8¼x3½ inches high. **Each** **$1.00**

Note: For test tube baskets, see page 373.

Surface Tension Apparatus



371M1



371M3

371M1 Surface Tension Apparatus (Du Nouy). For measuring surface tension of liquids. A fine steel torsion wire is secured at both ends in torsion heads, each of which is driven by a worm gear arrangement. The forward torsion head extends through the scale and carries a vernier which permits a reading of the scale directly to .1 dyne and estimation to .05 dyne. Values reproducible to ±.05 dyne can be secured directly from the scale without calculation.

The scale, ranging from 0 to 110°, is engraved on a 4-inch nickel silver dial. The torsion head is ball-bearing. The fine adjustment of the position of the platform which carries the liquid to be tested is secured by means of a micrometer screw.

The ring and supporting stirrup are made of platinum-iridium wire, and all the essential parts are supported on a suitable tripod which is provided with leveling screws. Supports are finished in black; scale, vernier and adjusting device are made of nickel silver. Complete with torsion wire, 4 cm. platinum-iridiom ring, carrying case and directions for use. **Each**............ **$100.00**

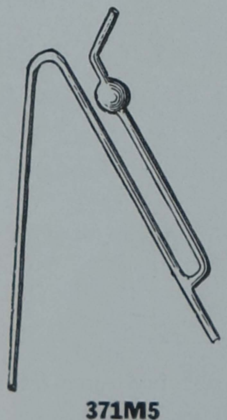
371M2 Rings, Platinum-Iridium. For use with 371M1. Mean circumference, 4 cm. **Each**........................ **$6.00**

371M3 Surface Tension Balances. Designed especially for measuring the surface tension of liquids. A double scale—one reading in milli-grams, the other calibrated in dynes per centimeter—makes possible quick direct readings. The sample is carried in a watch glass on a stage which can be raised or lowered by a rack and pinion, operated by a knurled knob projecting out in front of the case. Capacity of the instrument is 1000 milli-grams.

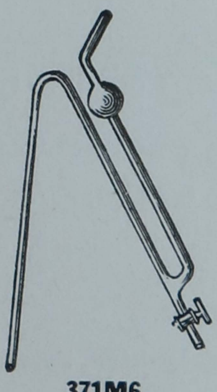
Complete equipment includes platinum ring, watch glass, check weights and a glass cover for shielding the hook, ring, liquid and stage. **Complete**........................ **$190.00**

371M4 Extra Platinum Rings. Each........................ **$15.00**

Syphon Tubes



371M5



371M6

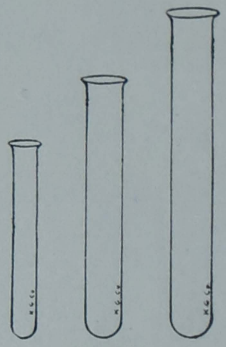
371M5 Syphon Tubes, Glass. With suction tube.

Length, insertion tube, mm.	200	375	750
Each	**$ .70**	**1.17**	**1.75**

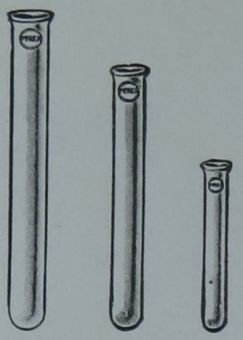
371M6 Syphon Tubes, Glass. With suction tube and stopcock.

Length, insertion tube, mm.	200	375	750
Each	**$1.50**	**1.75**	**2.50**

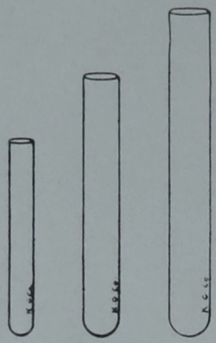
Test Tubes



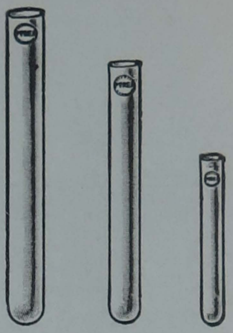
372M1



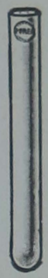
372M2



372M3



372M4



372M7

372M1 Test Tubes. Light wall, with rim.

Size, mm.	**75x10**	**75x25**	**100x13**	**125x16**	**150x16**	**150x18**	**150x25**	**175x22**	**200x25**	**250x25**
Size, inches	3x⅜	3x1	4x½	5x⅝	6x⅝	6x¾	6x1	7x⅞	8x1	10x1
Dozen	**$ .20**	**.40**	**.20**	**.25**	**.30**	**.35**	**.45**	**.40**	**.60**	**1.25**
Gross	**$1.50**	**4.20**	**1.65**	**2.25**	**2.40**	**2.75**	**4.40**	**3.95**	**5.35**	**12.00**

372M2 Test Tubes, Pyrex. Light wall, with rim.

Size, mm.	**75x10**	**75x12**	**110x13**	**100x25**	**125x15**	**150x16**
Size, inches	3x⅜	3x½	4x½	4x1	5x⅝	6x⅝
Quantity in case	720	720	720	432	720	576
Each	**$ .025**	**.025**	**.03**	**.075**	**.035**	**.04**
Case	**$16.20**	**16.20**	**19.44**	**29.16**	**22.68**	**20.74**

Size, mm., continued	**150x18**	**150x20**	**150x25**	**175x22**	**200x25**	**250x25**	**300x25**
Size, inches	6x¾	6x⅞	6x1	7x⅞	8x1	10x1	12x1
Quantity in case	576	576	360	432	288	144	144
Each	**$ .045**	**.055**	**.085**	**.065**	**.10**	**.14**	**.18**
Case	**$23.33**	**28.51**	**27.54**	**25.27**	**25.92**	**18.14**	**23.33**

372M3 Test Tubes, Culture. Light wall, without rim.

Size, mm.	**75x10**	**100x13**	**125x16**	**150x16**	**150x18**	**150x25**	**175x22**	**200x25**
Size, inches	3x⅜	4x½	5x⅝	6x⅝	6x¾	6x1	7x⅞	8x1
Dozen	**$ .20**	**.25**	**.30**	**.30**	**.35**	**.55**	**.45**	**.60**
Gross	**$1.80**	**2.00**	**2.70**	**2.90**	**3.30**	**5.30**	**4.75**	**6.40**

372M4 Test Tubes, Culture, Pyrex. Light wall, without rim.

Size, mm.	**75x10**	***75x12**	**100x13**	**100x25**	**125x15**	**150x16**
Size, inches	3x⅜	3x½	4x½	4x1	5x⅝	6x⅝
Quantity in case	720	720	720	432	720	576
Each	**$ .025**	**.025**	**.03**	**.075**	**.035**	**.04**
Case	**$16.20**	**16.20**	**19.44**	**29.16**	**22.68**	**20.74**

*Suitable for use as Kahn tube.

Size, mm., continued	**150x18**	**150x20**	**150x25**	**175x22**	**200x25**	**250x25**	**300x25**
Size, inches	6x¾	6x⅞	6x1	7x⅞	8x1	10x1	12x1
Quantity in case	576	576	360	432	288	144	144
Each	**$ .045**	**.055**	**.085**	**.065**	**.10**	**.14**	**.18**
Case	**$23.33**	**28.51**	**27.54**	**25.27**	**25.92**	**18.14**	**23.33**

372M5 Test Tubes, Precipitation, Kahn. Light wall, without rim. Size, 75x12 mm. (3x½ inches). **Dozen** .... **$ .25**
Gross **$2.00**

372M6 Test Tubes, Wasserman. Medium wall, without rim. Size, 100x10 mm. (4x⅜ inches). **Dozen, $ .55. Gross** . . **$5.00**

372M7 Test Tubes, Ignition, Pyrex. Heavy wall, without rim.

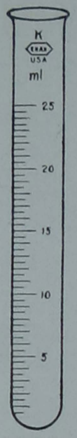
Size, mm.	***70x10**	**100x14**	**125x16**	**150x18**	**150x20**	**200x25**
Size, inches	2¾x⅜	4x⅝	5x⅝	6x¾	6x⅞	8x1
Quantity in case	432	288	288	144	144	120
Each	**$ .05**	**.065**	**.08**	**.12**	**.14**	**.20**
Case	**$19.44**	**16.85**	**20.74**	**15.55**	**18.14**	**21.60**

372M8 Test Tubes, Ignition, Pyrex. Heavy wall, without rim. Similar to 372M7, except fabricated from a higher softening point glass (Pyrex glass No. 172).

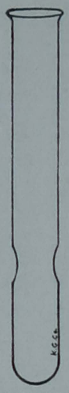
Size, mm.	***75x10**	**125x16**	***150x10**	**150x20**	**200x25**
Size, inches	3x⅜	5x⅝	6x⅜	6x⅞	8x1
Quantity in case	144	144	144	108	108
Each	**$ .08**	**.10**	**.09**	**.18**	**.27**
Case	**$10.37**	**12.96**	**11.66**	**17.50**	**26.24**

*Suitable for microchemical applications.

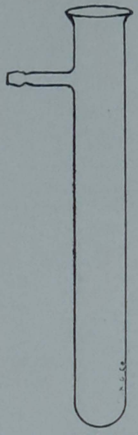
Test Tubes, Continued



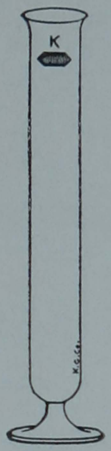
373M1



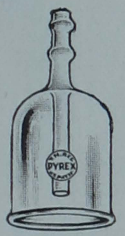
373M2



373M3



373M4



373M5

373M1 Test Tubes, Graduated, Exax Blue Line. With rim.

Capacity, ml.	**10**	**25**
Graduations, ml.	1/10	1/2
Each	**$ .40**	**.40**
Case of 72	**$23.04**	**23.04**

373M2 Test Tubes, Roux, Potato Culture. With rim. Length from center of constriction to rim, 150 mm.; diameter, 20 mm. **Each, $ .09. Case** of 144 . . . . . **$11.67**

373M3 Test Tubes, Side Neck. With rim and with side tube having constriction near the end to hold rubber tubing securely.

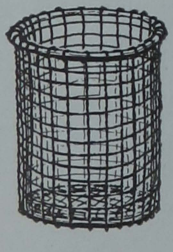
Size, mm.	**125x16**	**150x18**	**175x22**	**200x25**
Size, inches	5x5/8	6x3/4	7x7/8	8x1
Each	**$ .06**	**.08**	**.10**	**.12**
Case of 144	**$7.78**	**10.37**	**12.96**	**15.55**

373M4 Test Tubes, On Foot. With rim.

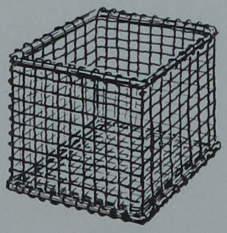
Size, mm.	**125x16**	**150x18**	**175x22**	**200x25**
Size, inches	5x5/8	6x3/4	7x7/8	8x1
Each	**$ .18**	**.18**	**.20**	**.25**

373M5 Test Tube Fillers, Pyrex. Will fit tubes without lip up to 20 mm. outside diameter. **Each** . . . . . **$ .50**

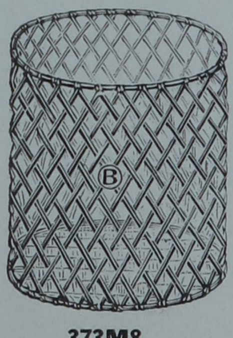
Test Tube Baskets



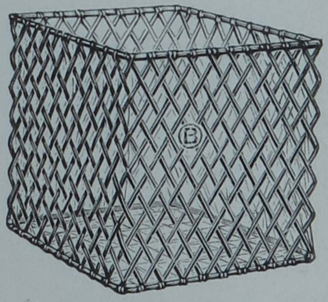
373M6



373M7



373M8



373M9

373M6 Test Tube Baskets, Round. Made of galvanized square mesh, reinforced at top and bottom. Diameter, 5 inches; height, 6 inches. **Each** . . . . . **$ .65**

373M7 Test Tube Baskets, Rectangular. Made of galvanized square mesh, reinforced at top and bottom.

Size	**1**	**2**	**3**	**4**
Length, inches	5	5	10	10
Width, inches	4	4	6	6
Height, inches	4	6	4	6
Each	**$ .60**	**.65**	**.95**	**1.00**

373M8 Test Tube Baskets, Round. Cadmium-plated wire, diamond mesh.

Diameter, inches	**6**	**9**
Height, inches	6	9
Each	**$1.00**	**1.80**

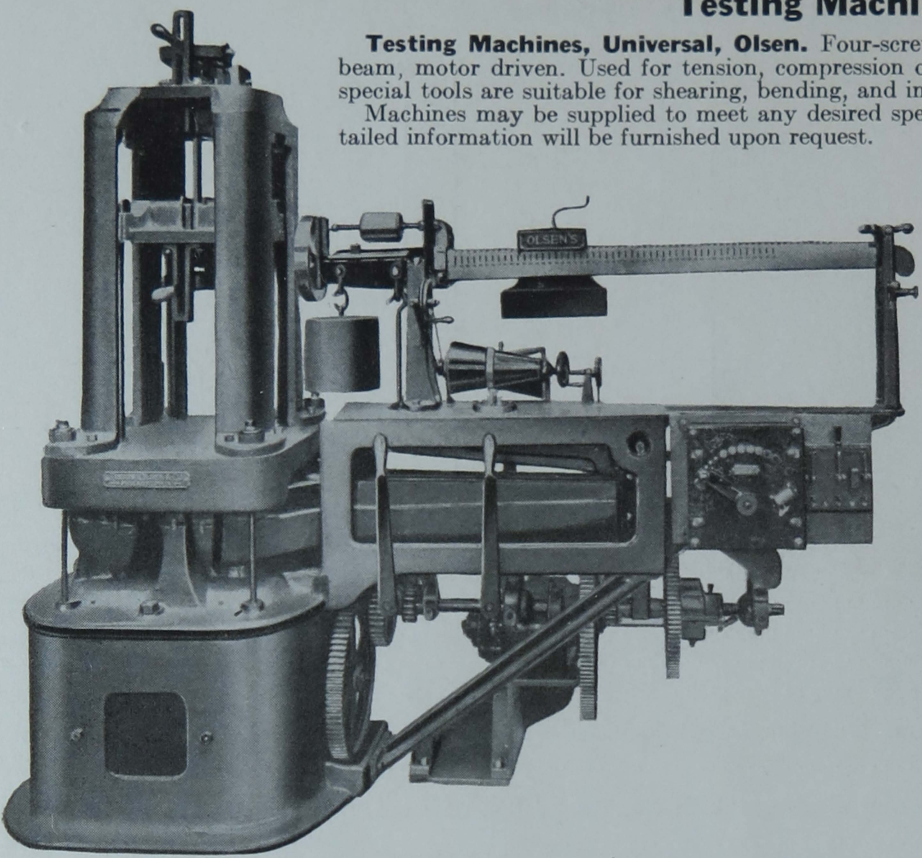
373M9 Test Tube Baskets, Rectangular. Cadmium-plated wire, diamond mesh.

Size	**1**	**2**	**3**
Length, inches	5	6	8½
Width, inches	4	6	5
Height, inches	5½	6	5½
Each	**$1.65**	**1.80**	**1.90**

Testing Machines

Testing Machines, Universal, Olsen. Four-screw rotating gearnut type with automatic beam, motor driven. Used for tension, compression or transverse tests; and when fitted with special tools are suitable for shearing, bending, and in some cases, small torsion tests.

Machines may be supplied to meet any desired specifications of any required capacity. Detailed information will be furnished upon request.



374M1

374M1 Testing Machines, Universal, Olsen. With automatic beam. Meets all ordinary requirements of the commercial or college laboratory. Has a wide range of speeds. Capacity, 30,000 pounds; maximum length compression tests, 20 inches; clearance between screws, 7½ inches. **Each** **$2500.00**

374M2 Testing Machines, Universal, Olsen. Capacity, 40,000 pounds; maximum length compression tests, 20 inches; clearance between screws, 7½ inches. **Each** **$2750.00**

374M3 Testing Machines, Universal, Olsen. Capacity, 50,000 pounds; maximum length compression tests, 23 inches; clearance between screws, 9¼ inches. **Each** **$3000.00**

374M4 Testing Machines, Universal, Olsen. Capacity, 60,000 pounds; maximum length compression tests, 23 inches; clearance between screws, 9¼ inches. **Each** **$3250.00**

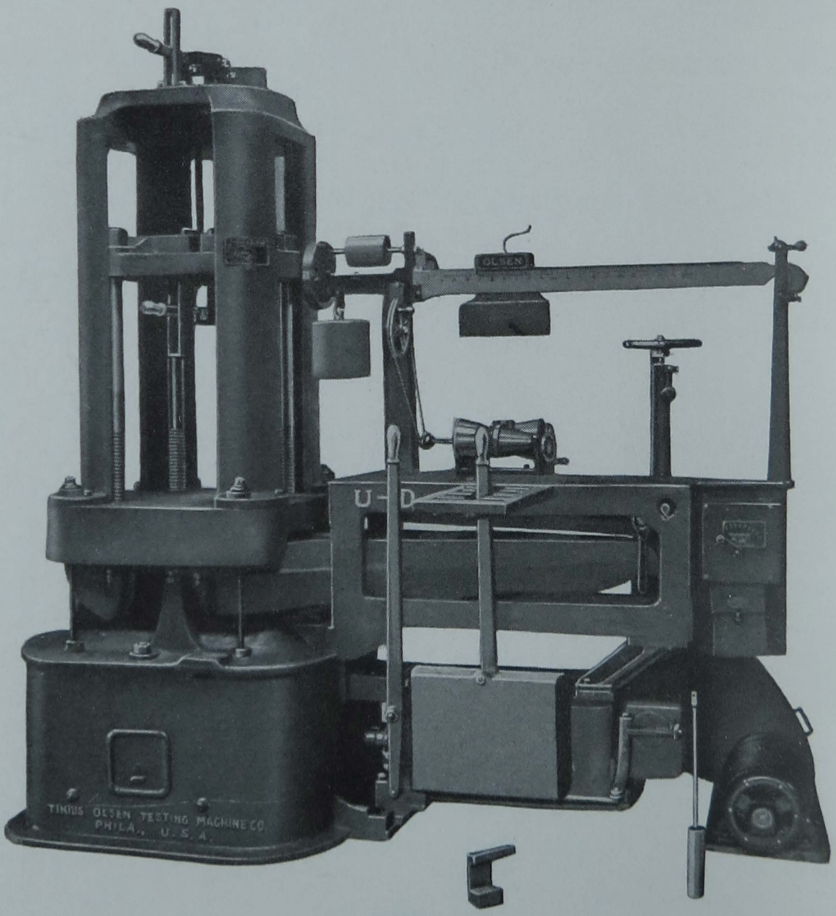
374M5 Testing Machines, Universal, Olsen. Capacity, 100,000 pounds; maximum length compression tests, 23 inches; clearance between screws, 10½ inches. **Each** **$4000.00**

Testing Machines, Universal, Olsen. With automatic beam and automotive gear box drive. All fast speed gearing is enclosed in a dust-proof housing and runs on ball bearings in a bath of oil. Constant speed motor is used with enclosed silent chain drive. Two levers, conveniently placed, control operation and eight speed changes. By operation of the left-hand lever the crosshead is raised or lowered. By means of the right-hand lever, the speeds of 0.05, 0.1, 0.2, 0.4, 1 or 2 inches per minute are obtained for testing to full capacity, and speeds of 4 and 8 inches per minute for applying light loads and for adjusting crosshead.

374M6 Testing Machines, Universal, Olsen. With automatic beam and automotive gear box drive. Capacity, 200,000 pounds; maximum length compression tests, 36 inches; clearance between screws, 15 inches. **Each** ... **$6250.00**

374M7 Testing Machines, Universal, Olsen. Capacity, 300,000 pounds; maximum length compression tests, 34 inches. Clearance between screws, 18 inches. **Each** .. **$8750.00**

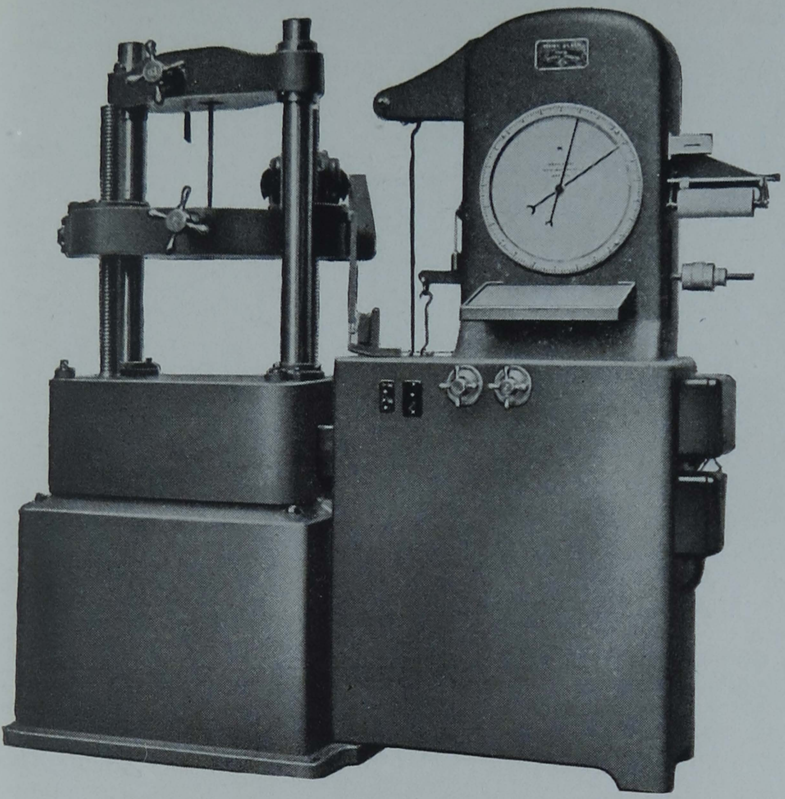
374M8 Testing Machines, Universal, Olsen. Capacity, 400,000 pounds; maximum length compression tests, 33 inches. Clearance between screws, 12¾ inches. **Each** **$9750.00**



374M6

Complete catalog of testing machines sent upon request.

Testing Machines, Continued



375M1

375M1 Testing Machines, Hydraulic, Universal, Olsen. Motor driven, with self-indicating pendulum dial, lever weighing system, recorder, and loading rate indicator.

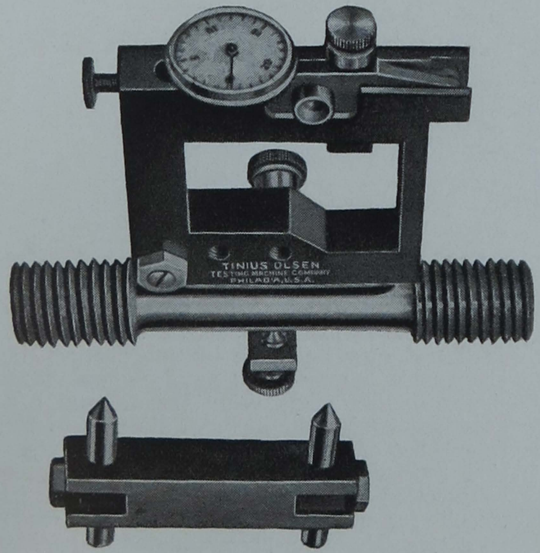
The pendulum dial weighing system balances the load at all times and follows any increase or decrease in load with great sensitivity. The indicator pointer makes two complete revolutions of the 18-inch diameter dial to each capacity range, thus giving the open marking equivalent to a 36-inch diameter dial or a linear scale over 110 inches long. Four capacity ranges of full, one-half, one-tenth and one-twentieth rated capacity of the machine are furnished as standard. The weighing system is calibrated accurately before delivery and will maintain this accuracy over long periods. It is independent of the loading system.

The position of the moving crosshead can be adjusted easily to take different lengths of test specimens by means of the high speed motor shown at the back of the moving head. Overload and overtravel safety adjustments are furnished.

The autographic recorder determines stress-strain curves automatically and accurately on rectilinear cross-section paper of standard letter size. Magnification of the recorder is 10 to 1.

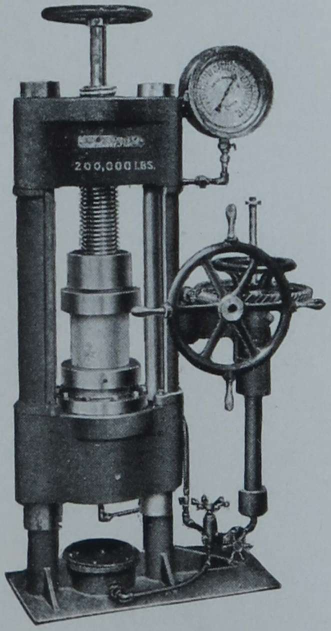
Wedge grip tools for round and flat specimens, are furnished as standard equipment.

Capacity, pounds	**50,000**	**60,000**	**100,000**	**150,000**	**200,000**	**300,000**	**400,000**
Maximum extended length							
Tension	15 in.	15 in.	22 in.	22 in.			
Compression	23 in.	23 in.	24 in.	24 in.			
Clearance between screws	18½ in.	18½ in.	20 in.	20 in.			
Dimensions of machine					Data upon request.		
Length	8 ft. 6 in.	8 ft. 6 in.	9 ft. 0 in.	9 ft. 4 in.			
Width	3 ft. 0 in.	3 ft. 0 in.	3 ft. 4 in.	3 ft. 4 in.			
Height	7 ft. 2 in.	7 ft. 2 in.	7 ft. 8 in.	7 ft. 8 in.			
Weight, pounds	7,200	7,200	11,105	11,600			
Each	**$4750.00**	**5000.00**	**5750.00**	**6500.00**			



375M2

375M2 Testing Machine Strain Gauge Extensometers. May be set to read extension or compression in either a 2-inch or a 1-inch gauge length. With the instrument set in punch marks, each mark on the dial indicates 0.000066 inch; or when set in 1/16-inch drilled holes, 0.00006 of an inch. Weight, including case, 3 pounds. **Each** **$160.00**



375M3

375M3 Testing Machines, Hydraulic, Compression, Olsen. A self-contained machine for cement, concrete, and general compression tests. Loading is by a single-stroke screw-pump, hand operated, with quick shift from fast to slow speed.

A valve system permits holding the load while refilling the pump cylinder for another stroke, in case a test should require additional travel.

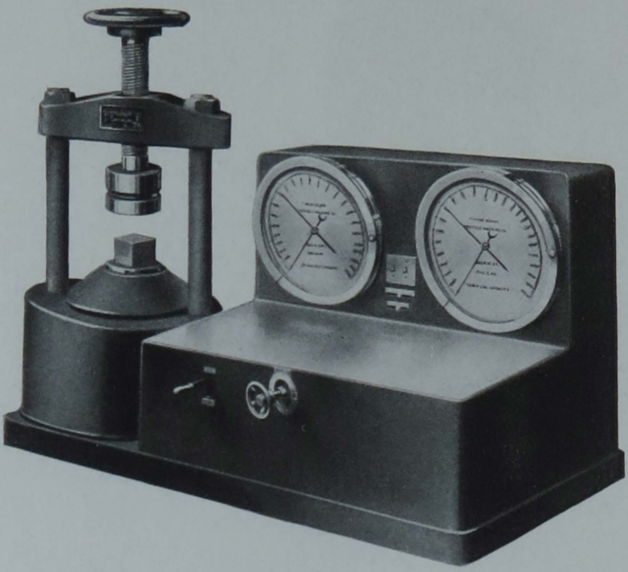
The machine will accommodate specimens of 8-inch diameter and 16-inch height.

Length, 3 feet, 3 inches; width, 1 foot, 6 inches.

Capacity, pounds	**100,000**	**200,000**
Height	5 ft. 6 in.	6 ft. 2 in.
Weight, pounds	1,600	2,000
Each	**$1250.00**	**$1250.00**

Complete catalog of testing machines sent upon request.

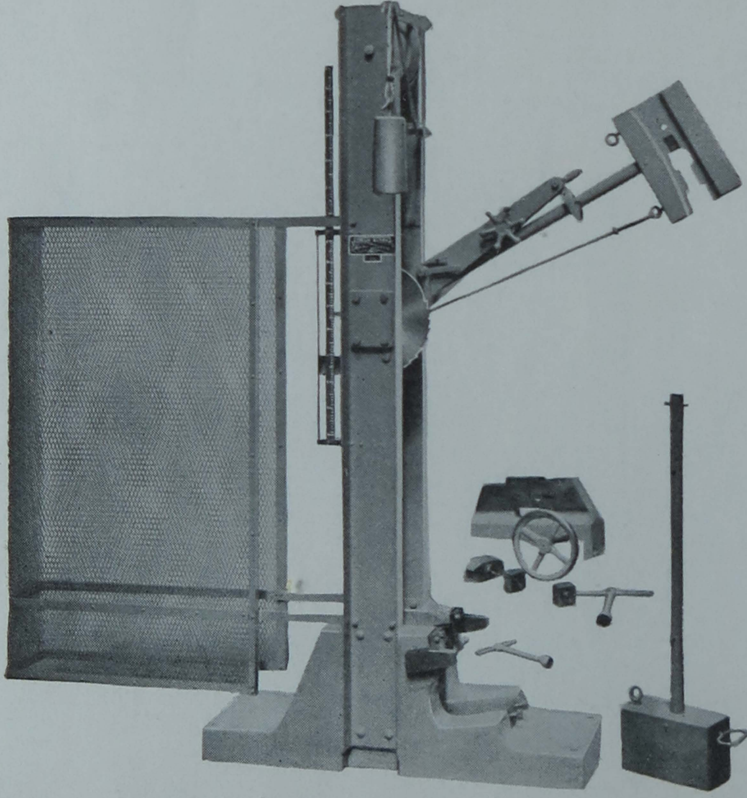
Testing Machines, Continued



376M1

376M1 Testing Machines, Hydraulic, Compression, Olsen. Bench type. All packing on the main cylinder is eliminated. Piston is protected from dust and shattering material. All working parts are enclosed. Hydraulic load is applied to the piston by a direct motor driven rotary pump at constant speed. Accurate piston speed control is obtained with a sensitive valve at all capacity ranges. The load is indicated by either of two hydraulic dials, one for half and the other for full capacity, with quick shift from dial to dial. A suspended spherical compression block is provided, adjustable to accommodate specimens up to 8 inches high. Clearance between straining rods is 11 inches.

Capacity, pounds	**20,000**	**30,000**	**40,000**	**50,000**	**60,000**	**70,000**	**80,000**
Length	4 ft. 0 in.	4 ft. 0 in.	4 ft. 0 in.	4 ft. 2 in.	4 ft. 2 in.	4 ft. 4 in.	4 ft. 4 in.
Width	1 ft. 10 in.	1 ft. 10 in.	1 ft. 10 in.	2 ft. 0 in.	2 ft. 0 in.	2 ft. 2 in.	2 ft. 2 in.
Height	3 ft. 6 in.	3 ft. 6 in.	3 ft. 6 in.	3 ft. 8 in.	3 ft. 8 in.	3 ft. 10 in.	3 ft. 10 in.
Weight, net, pounds	1000	1000	1000	1100	1100	1350	1350
Weight, shipping, pounds	1200	1200	1200	1350	1350	1650	1650
Each	**$2000.00**	**2000.00**	**2000.00**	**2000.00**	**2000.00**	**2000.00**	**2000.00**

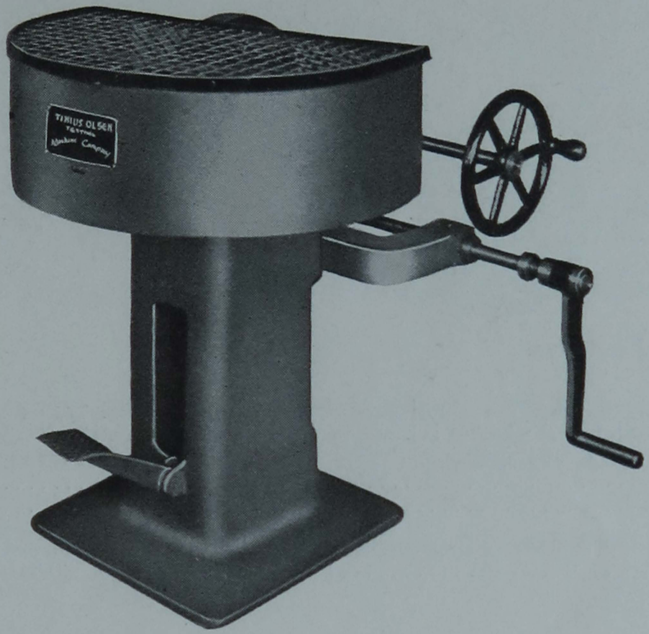


376M2

376M2 Testing Machines, Impact, Universal, Olsen. For Charpy, Izod, impact tension and impact torsion tests. The machine is arranged for making the standard Charpy impact test, while the standard Izod test may be made by substituting the interchangeable hammer and anvil shown. Impact tension tests are made using the Charpy pendulum. Standard equipment includes attachment for small, round, flat or headed tension specimen. Impact torsion tests can be made, using either hammer, in conjunction with the correct scale for that hammer. Results for all tests are read directly in foot pounds on a straight, uniformly graduated scale. Maximum capacities: For Izod tests—264 foot pounds; for Charpy test—240 foot pounds. Dimensions: Height, 6 feet, 6 inches; width, 2 feet, 2 inches; length, 7 feet. Weight: net, 1150 pounds; shipping, 1380 pounds.
Each **$1200.00**

Complete catalog of testing machines sent upon request.

Testing Machines, Continued



377M1

Testing Machines, Cold Bend, Olsen. Suitable for bending iron or steel specimens up to one inch square bar, or plates up to 3 inches in width. The specimen to be tested is bent through a maximum of 180° around a center pin of proper size to suit specifications. The pusher pin may be adjusted in its relation to the center pin so that a round bend can be obtained readily. Five bending pins are supplied with machine: ½-inch, ¾-inch, 1-inch, 1½-inch and 2-inch. These pins are rounded on the working edge to proper radius but are made deep in section so as to give greater strength and stiffness; and are equipped with a double bearing to prevent deflection. Machine is provided with a heavy cast iron housing and wire mesh top around the specimen so as to protect the operator against possible injury from fracture of specimen during test.

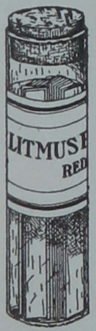
377M1 Testing Machines, Cold Bend, Olsen, Hand Operated. Dimensions: length, 3 feet; breadth, 4 feet, 3 inches; height, 3 feet, 8 inches. Weight, 1,300 pounds. **Each** **$1000.00**

377M2 Testing Machines, Cold Bend, Olsen, Belt Driven. Dimensions: length, 3 feet; breadth, 4 feet; height, 3 feet, 8 inches. Weight, 1,350 pounds. **Each** **$1250.00**

377M3 Testing Machines, Cold Bend, Olsen, Motor Driven. Dimensions: length, 4 feet; breadth, 4 feet; height, 3 feet, 8 inches. Weight, 1500 pounds. **Each** **$1375.00**

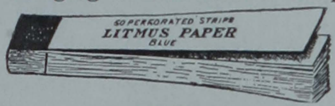
Complete catalog of testing machines sent upon request.

Test Papers



377M5

Test Papers, in Vials. Each vial contains 100 strips.	**Each**	**Dozen**
377M4 Litmus, Blue. Turns red in presence of acids	$ .05	$ .50
377M5 Litmus, Red. Turns blue in presence of alkalies	.05	.50
377M6 Litmus, Neutral. Turns red in presence of acids, blue in presence of alkalies	.05	.50
377M7 Congo Red. Turns blue in presence of acids, red in presence of alkalies	.05	.50
377M8 Lead Acetate. Turns black in presence of inorganic sulphides	.05	.50
377M9 Phenolphthalein. Turns red in presence of alkalies	.07	.70
377M10 Potassium Iodide Starch. Turns blue in presence of free iodine	.07	.70
377M11 Turmeric. Turns brown in presence of alkalies; color is restored by acids, except boric which turns it to reddish brown, changing to blue black in the presence of ammonia	.07	.70

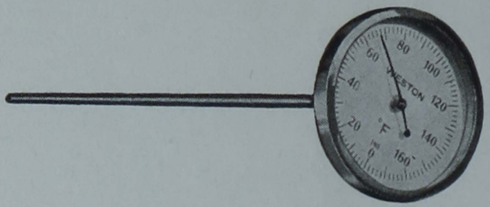


377M12

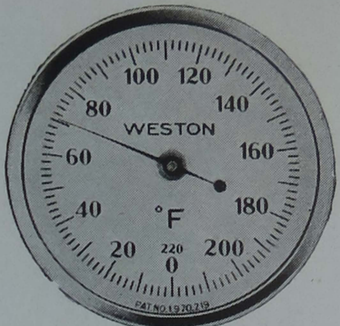
Test Papers in Books. Each book contains 25 strips.	**Each**	**Dozen**
377M12 Litmus, Blue	$ .05	$ .35
377M13 Litmus, Red	.05	.35
377M14 Litmus, Neutral	.05	.35

Test Papers, in Sheets. Each sheet 8x10 inches.	**Each**	**Quire** (24)
377M15 Litmus, Blue	$ .05	$ .50
377M16 Litmus, Red	.05	.50
377M17 Litmus, Neutral	.05	.50
377M18 Congo Red	.05	.50
377M19 Lead Acetate	.05	.50
377M20 Phenolphthalein	.05	.50
377M21 Potassium Iodide Starch	.05	.50
377M22 Turmeric	.05	.50

Thermometers



378M2 Dial and Stem



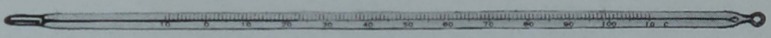
378M2 Dial Only

378M1 Thermometers, Laboratory, Weston. Centigrade scale. All metal. Dial type scale, 1½ inches in diameter. Guaranteed accuracy of ½ of 1%. The stainless steel stem is made of an 18-8 alloy which is corrosion resistant to most acids and gases. To obtain accurate readings, insert at least 2 inches of the stem in liquids and 4 inches in gases.

Range, degrees, C.	0 to 100	0 to 150	0 to 250
Each	**$4.25**	**4.25**	**5.25**

378M2 Thermometers, Laboratory, Weston. Fahrenheit scale. Otherwise same as 378M1.

Range, degrees, F.	0 to 180	0 to 220	50 to 250	50 to 300	50 to 400	50 to 500
Each	**$4.25**	**4.25**	**4.50**	**5.00**	**5.50**	**6.00**



378M3

378M3 Thermometers, Chemical, Etched Stem, Student Grade. Centigrade scale. For total immersion.

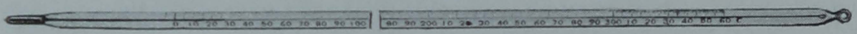
Range, degrees, C.	**-10 to 110**	**-10 to 150**	**-5 to 200**	**-5 to 250**	**-5 to 360**
Graduations, degrees	1	1	1	1	1
Length, inches	12	12	14	14	15
Each	**$ .60**	**.65**	**.70**	**.85**	**1.05**

378M4 Thermometers, Chemical, Etched Stem, Student Grade. Fahrenheit scale. For total immersion.

Range, degrees, F.	**-10 to 120**	**0 to 220**	**0 to 300**	**30 to 400**	**30 to 500**	**30 to 600**	**30 to 700**
Graduations, degrees	1	2	2	2	2	2	2
Length, inches	12	12	12	14	14	14	15
Each	**$ .60**	**.60**	**.65**	**.75**	**.85**	**.90**	**1.05**

378M5 Thermometers, Chemical, Etched Stem, Student Grade. Centigrade and Fahrenheit scales. For total immersion.

Range, degrees, C.	**-10 to 110**	**-10 to 150**	**-5 to 200**	**-5 to 360**
Range, degrees, F.	**20 to 220**	**20 to 300**	**20 to 400**	**20 to 680**
Graduations, degrees, C.	1	1	1	1
Graduations, degrees, F.	2	2	2	2
Length, inches	12	12	14	15
Each	**$ .70**	**.75**	**.95**	**1.20**



378M6

378M6 Thermometers, Chemical, Etched Stem, Laboratory Grade. Centigrade scale. For total immersion.

Range, degrees, C.	**-10 to 110**	**-10 to 150**	**-5 to 200**	**-5 to 250**	**-5 to 360**	**-5 to 400**	**-10 to 500**
Graduations, degrees	1	1	1	1	1	1	2
Length, inches	12	12	14	14	15	16	16
Each	**$ .80**	**.85**	**1.00**	**1.10**	**1.30**	**1.60**	**2.00**

378M7 Thermometers, Chemical, Etched Stem, Laboratory Grade. Fahrenheit scale. For total immersion.

Range, degrees, F.	**-10 to 120**	**0 to 220**	**0 to 300**	**30 to 400**	**30 to 500**
Graduations, degrees, F.	1	2	2	2	2
Length, inches	12	12	12	14	14
Each	**$ .80**	**.80**	**.85**	**1.00**	**1.10**

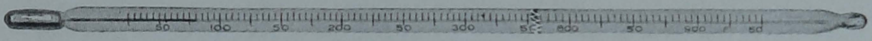
Range, degrees, F., continued	**30 to 600**	**30 to 700**	**30 to 800**	**20 to 940**
Graduations, degrees, F.	2	2	2	5
Length, inches	14	15	16	16
Each	**$1.20**	**1.25**	**1.60**	**2.00**

378M8 Thermometers, Chemical, Etched Stem, Laboratory Grade. Centigrade and Fahrenheit scales. For total immersion.

Range, degrees, C.	**-10 to 110**	**-10 to 150**	**-5 to 200**	**-5 to 360**
Range, degrees, F.	**20 to 220**	**20 to 300**	**20 to 400**	**20 to 680**
Graduations, degrees, C.	1	1	1	1
Graduations, degrees, F.	2	2	2	2
Length, inches	12	12	14	15
Each	**$1.05**	**1.15**	**1.30**	**1.80**

Thermometers, Continued

Thermometers, Chemical, Etched Stem, Tag Standard Grade. A special annealing process ages the thermometer glass and nullifies the effects of subsequent exposures to alterations of heat and cold. Thermometers graduated up to and including 500° F. are constructed with expansion chamber and are filled with an inert gas under pressure, above the mercury column. This construction allows for overheating and assists in joining the mercury column should it become separated. Normal glass is used for the low temperatures; borosilicate, for the high. Improved black and red pigments are used to fill in lines, numbers and letters. The thermometers are accurate to within ½ scale division in ranges 0° to 100° C. or 32° to 212° F., and from ½ to one scale division above and below these ranges.



379M2

379M1 Thermometers, Chemical, Etched Stem, Tag Standard Grade. Centigrade scale. For total immersion.

Number	**51249**	**51250**	**51252**	**51255**	**51256**	**51258**	**51260**	**51262**	**51264**
Range, degrees, C.	-100 to 50	-40 to 50	-20 to 50	-20 to 105	-40 to 105	0 to 105	0 to 105	0 to 150	0 to 150
Graduations, degrees, C.	1	½	½	1	½	½	½	½	½
Length, inches	12	12	12	12	15	12	15	12	15
Each	**$6.00**	**1.80**	**1.80**	**1.80**	**2.00**	**1.80**	**2.00**	**1.80**	**2.00**

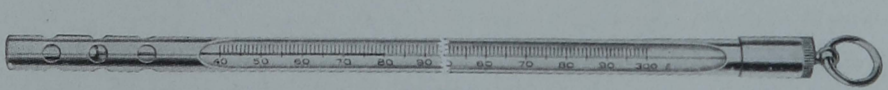
Number, continued	**51266**	**51268**	**51270**	**51272**	**51274**	**51278**	**51282**	**51284**
Range, degrees, C.	0 to 200	0 to 200	0 to 260	0 to 315	0 to 370	0 to 425	0 to 480	0 to 510
Graduation, degrees, C.	1	½	1	1	1	1	2	2
Length, inches	12	15	15	15	15	15	15	15
Each	**$2.30**	**2.50**	**2.60**	**2.77**	**3.00**	**3.20**	**4.25**	**5.25**

379M2 Thermometers, Chemical, Etched Stem, Tag Standard Grade. Fahrenheit scale.

Number	**51200**	**51202**	**51205**	**51206**	**51208**	**51210**	**51212**	**51214**
Range, degrees, F.	-40 to 120	0 to 120	0 to 220	-40 to 220	30 to 220	30 to 220	30 to 300	30 to 300
Graduations, degrees, F.	1	1	2	1	1	1	1	1
Immersion, inches	Total	Total	Total	Total	Total	Total	Total	Total
Length, inches	12	12	12	15	12	15	12	15
Each	**$1.80**	**1.80**	**1.80**	**2.00**	**1.80**	**2.00**	**1.80**	**2.00**

Number, continued	**51216**	**51218**	**51220**	**51222**	**51224**	**51228**	**51232**	**51234**
Range, degrees, F.	30 to 400	30 to 400	30 to 500	30 to 600	30 to 700	30 to 800	30 to 900	30 to 950
Graduations, degrees, F.	2	1	2	2	2	2	5	5
Immersion, inches	Total	Total	Total	Total	Total	Total	Total	Total
Length, inches	12	15	15	15	15	15	15	15
Each	**$2.30**	**2.50**	**2.60**	**2.77**	**3.00**	**3.20**	**4.25**	**5.25**

Number, continued	**51235**	**51237**	**51239**	**51241**	**51243**	**51245**	**51143**
Range, degrees, F.	-40 to 120	0 to 220	30 to 300	30 to 400	30 to 600	30 to 800	30 to 950
Graduations, degrees, F.	1	2	2	2	2	2	5
Immersion, inches	3	3	3	3	3	3	3
Length, inches	12	12	12	15	15	15	16
Each	**$1.80**	**1.80**	**1.80**	**2.50**	**2.77**	**3.20**	**5.25**



379M4

379M3 Thermometers, Chemical, Etched Stem, Armored, Tag Standard Grade. Centigrade scale. Same as 379M1, except with metal armors. For total immersion.

Number	**51258A**	**51262A**	**51266A**	**51272A**	**51278A**
Range, degrees, C.	0 to 105	0 to 150	0 to 200	0 to 315	0 to 425
Graduations, degrees, C.	½	½	1	1	1
Length, inches	12	12	12	15	15
Each	**$3.50**	**3.50**	**4.00**	**4.67**	**5.10**

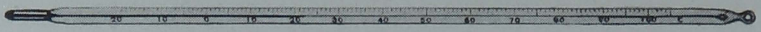
379M4 Thermometers, Chemical, Etched Stem, Armored, Tag Standard Grade. Fahrenheit scale. Same as 379M2, except with metal armors. For total immersion.

Number	**51202A**	**51205A**	**51214A**	**51218A**	**51222A**	**51234A**
Range, degrees, F.	0 to 120	0 to 220	30 to 300	30 to 400	30 to 600	30 to 950
Graduations, degrees, F.	1	2	1	1	2	5
Length, inches	12	12	15	15	15	15
Each	**$3.50**	**3.50**	**3.90**	**4.40**	**4.67**	**7.15**

379M5 Thermometer Armors. For protection of etched stem thermometers against breakage.

For thermometer length, inches	6½	12	15	16	18
Each	**$1.00**	**1.70**	**1.90**	**2.05**	**2.30**

Thermometers, Continued



380M1

380M1 Thermometers, Chemical, Red Back, Etched Stem, Tag, Standard Grade. Centigrade scale. The tube has a fused-in red background which shows red above the mercury column and both are magnified by a lens front. These features enable quick and easy temperature determinations. The triangular cross section of this thermometer made necessary by the lens front does not permit a tight seal if the thermometer tube is used in a rubber stopper. Accurate to within ½ scale division in range, 0 to 100° C. or 32° to 212° F., and from ½ to 1 division above and below these temperatures. For total immersion.

Number	**51255R**	**51262R**	**51266R**	**51272R**	**51278R**
Range, degrees, C.	-20 to 105	0 to 150	0 to 200	0 to 315	0 to 425
Graduations, degrees, C.	1	½	1	1	1
Length, inches	12	12	12	15	15
Each	**$1.80**	**1.80**	**2.30**	**2.77**	**3.20**

380M2 Thermometers, Chemical, Red Back, Etched Stem, Tag, Standard Grade. Fahrenheit scale. Otherwise same as 380M1.

Number	**51202R**	**51205R**	**51212R**	**51216R**	**51222R**
Range, degrees, F.	0 to 120	0 to 220	30 to 300	30 to 400	30 to 600
Graduations, degrees, F.	1	2	1	2	2
Length, inches	12	12	12	12	15
Each	**$1.80**	**1.80**	**1.80**	**2.30**	**2.77**

380M3 Thermometers, Chemical, Etched Stem, General Testing, Fractional Division. Centigrade scale. For total immersion.

Range, degrees, C.	**0 to 50**	**0 to 50**	**0 to 100**	**0 to 100**	**0 to 200**	**100 to 200**
Graduations, degrees, C.	1/10	1/5	1/10	1/5	1/5	1/5
Length, mm.	380	330	600	400	600	500
Each	**$3.50**	**3.00**	**5.75**	**4.75**	**6.00**	**6.00**

380M4 Thermometers, Incubator, Etched Stem. Range, 0° to 60° C. in ½° graduations. Stem length, 14 cm.; overall length, 30 cm. **Each** **$2.50**

380M5 Thermometers, Incubator, Etched Stem. Range, 0° to 50 C. with red line at 37½° C. Enclosed scale. Length, 10 inches. **Each** **$2.00**

380M9

380M6 Thermometers, Etched Stem, for General Testing, Tag Extreme Precision Grade. Centigrade scale. Permanently accurate to within ½ scale division from 0 to 100° C., and within 1 scale division above or below these temperatures. Ice point (0° C.) is provided for checking purposes where this graduation is not included in the scale. Length, 18 inches. For total immersion. Complete with felt-lined, nickeled-metal protection case.

Numbers	**51008**	**51009**	**51010**	**51012**	**51014**
Range, degrees, C.	-36 to 54	0 to 50	-2 to 105	90 to 200	200 to 400
Graduations, degrees, C.	1/5	1/10	1/5	1/5	½
Each	**$11.50**	**12.00**	**11.50**	**12.00**	**12.50**

Note: Thermometers, 380M6, in equivalent Fahrenheit range supplied on request.

380M7 Thermometers, Etched Stem, for Gas Calorimeters, Tag Extreme Precision Grade. For inlet water. Range, 45° to 95° F. in 1/10° divisions. Permanently accurate to within one scale division. Length, 18 inches. For total immersion. Complete with felt-lined, nickeled-metal protection case. **Each** **$12.00**

380M8 Thermometers, Etched Stem, for Gas Calorimeters, Tag Extreme Precision Grade. For outlet water. Range, 60° to 110° F. in 1/10° divisions. Otherwise, same as 380M7. **Each** **$12.00**

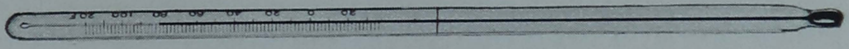
380M9 Thermometers, Etched Stem, for Fuel Calorimeters, Tag Extreme Precision Grade. Centigrade scale. Change of correction over 2° C. interval will not exceed 0.03° C. For total immersion. Complete with felt-lined, nickeled-metal protection case.

Number	**51075**	**51077**
Range, degrees, C.	18 to 30	18 to 28
Graduations, degrees, C.	1/50	1/100
Length, inches	18	24
Each	**$13.50**	**18.00**

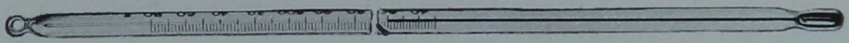
380M10 Thermometers, Etched Stem, for Fuel Calorimeters, Tag Extreme Precision Grade. Fahrenheit scale. Change of correction over 5° F. interval will not exceed 0.05° F. For total immersion. Complete with felt-lined, nickeled-metal protection case.

Number	**51070**	**51072**
Range, degrees, F.	65 to 90	65 to 105
Graduations, degrees, F.	1/20	1/20
Length, inches	18	24
Each	**$13.50**	**18.00**

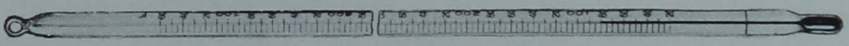
Thermometers, Etched Stem, A. S. T. M., Tag



381M2



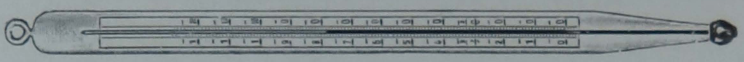
381M5



381M15

Catalog Number	Tag Number	Test	A. S. T. M. Method	Range Degrees	Grad. Degrees	Length Inches	Immersion	Each
381M1	51131	Acid Heat Test	D-481-T	30-220 F.	1	15¼	6 in.	**$4.00**
381M2	55560	Cloud and Pour, High	D-97	-36-120 F.	2	8¾	4¼ in.	**2.10**
381M3	55561	Cloud and Pour, Low	D-97	-70-70 F.	2	9	4¼ in.	**3.00**
381M4	55872	Distillation, High	D-86	30-760 F.	2	15	Total	**3.75**
381M5	55870	Distillation, Low	D-86	30-580 F.	2	15	Total	**3.15**
381M6	55876	Distillation, High	D-86	0-400 C.	1	15	Total	**3.75**
381M7	55874	Distillation, Low	D-86	0-300 C.	1	15	Total	**3.15**
381M8	56070	Flash, Tag Closed, High	D-56	20-230 F.	1	10⅞	2¼ in.	**3.37**
381M9	56085	Flash, Tag Closed, Low	D-56	0-120 F.	1	10⅞	2¼ in.	**3.37**
381M10	56080	Flash, Tag Closed, High	D-56	-7-110 C.	½	10⅞	2¼ in.	**3.37**
381M11	56090	Flash, Tag Closed, Low	D-56	-20-50 C.	½	10⅞	2¼ in.	**3.37**
381M12	.....	Flash, Closed, Elliott, High	None	0-600 F.	2	14	Total	**2.50**
381M13	56165	Flash, Closed, Elliott, Low	None	30-220 F.	1	15	Total	**2.50**
381M14	56120	Flash, Open	None	-20-230 F.	1	12	Total	**1.50**
381M15	56010	Flash and Fire, Cleveland	D-92	20-760 F.	5	12	1 in.	**3.75**
381M16	55970	Flash, Pensky Martens, High	D-93	200-700 F.	5	10⅞	2¼ in.	**4.50**
381M17	55960	Flash, Pensky Martens, Low	D-93	20-230 F.	1	10⅞	2¼ in.	**3.37**
381M18	55975	Flash, Pensky Martens, High	D-93	90-370 C.	2	10⅞	2¼ in.	**4.50**
381M19	55965	Flash, Pensky Martens, Low	D-93	-7-110 C.	½	10⅞	2¼ in.	**3.37**
381M20	51142	General Testing	D-182	20-760 F.	2	16	3 in.	**4.50**
381M21	51140	General Testing	D-182	20-580 F.	2	15	3 in.	**3.56**
381M22	51138	General Testing	D-182	-5-300 F.	2	12	3 in.	**2.63**
381M23	51148	General Testing	D-182	-5-400 C.	1	16	3 in.	**4.50**
381M24	51146	General Testing	D-182	-5-300 C.	1	15	3 in.	**3.56**
381M25	51144	General Testing	D-182	-20-150 C.	1	12	3 in.	**2.63**
381M26	51157	Gravity	D-287	-5-215 F.	½	16	Total	**4.50**
381M27	51158	Gravity	D-287	-20-102 C.	⅕	16	Total	**4.50**
381M28	51129	Loss on Heating	D-6	155-170 C.	½	6	Total	**7.00**
381M29	55680	Melting, Wax and Petrolatum	D-87	80-160 F.	⅕	14½	3⅛ in.	**4.50**
381M30	55710	Melting, Petrolatum, Saybolt	None	90-150 F.	½	12	2 in.	**3.00**
381M31	55764	Softening, Pitch and Tar, High	D-36	85-320 F.	1	15	Total	**3.75**
381M32	55763	Softening, Pitch and Tar, Low	D-36	30-180 F.	½	15	Total	**4.50**
381M33	55762	Softening, Pitch and Tar, High	D-36	30-160 C.	½	15	Total	**3.75**
381M34	55761	Softening Pitch and Tar, Low	D-36	-2-80 C.	⅕	15	Total	**4.50**
381M35	55520	Thermo Viscometer, Saybolt	None	60-110 F.	⅕	15⅝	Total	**8.20**
381M36	56325	Vapor-Pressure Air Chamber, Reid	D-323-T	-30-120 F.	1	12	Total	**1.80**
381M37	56320	Vapor-Pressure Water Bath, Reid	D-323-T	94-108 F.	⅕	10	Total	**2.63**
381M38	51180	Viscosity, Engler	D-300	95-105 C.	⅕	8	90 mm.	**4.50**
381M39	51175	Viscosity, Engler	D-300	39-54 C.	⅕	9	90 mm.	**4.50**
381M40	51170	Viscosity, Engler	D-300	18-28 C.	⅕	8	90 mm.	**4.50**
381M41	55447	Viscosity, Saybolt	D-88	204-218 F.	⅕	10	Total	**2.63**
381M42	55449	Viscosity, Saybolt	D-88	174-188 F.	⅕	10	Total	**2.63**
381M43	55446	Viscosity, Saybolt	None	138-154 F.	⅕	10	Total	**2.63**
381M44	55448	Viscosity, Saybolt	D-88	134-148 F.	⅕	10	Total	**2.63**
381M45	55445	Viscosity, Saybolt	D-88	120-134 F.	⅕	10	Total	**2.63**
381M46	55444	Viscosity, Saybolt	D-88	94-108 F.	⅕	10	Total	**2.63**
381M47	55443	Viscosity, Saybolt	D-88	66-80 F.	⅕	10	Total	**2.63**

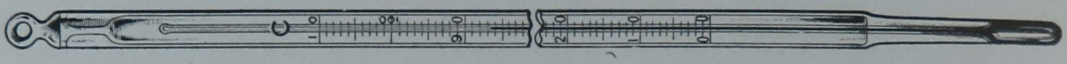
Thermometers, Continued



382M1

382M1 Thermometers, Chemical, Glass Enclosed Paper Scale, Tag. Fahrenheit scale. Graduations in 1°. Length, 12 inches.

Range, degrees, F.	-40 to 120	0 to 220	30 to 300
Each	**$1.50**	**1.50**	**2.00**



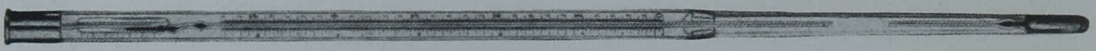
382M2

382M2 Thermometers, Chemical, Enclosed Milk Glass Scale. Centigrade scale. Graduated in 1°.

Range, degrees, C.	**-10 to 110**	**0 to 150**	**0 to 200**	**0 to 250**	**0 to 300**	**0 to 360**
Length, inches	12	12	12	14	14	14
Each	**$ .95**	**1.20**	**1.40**	**1.50**	**1.55**	**1.60**

382M3 Thermometers, Chemical, Enclosed Milk Glass Scale. Fahrenheit scale. Graduated in 1°.

Range, degrees, F.	**10 to 212**	**30 to 300**	**30 to 400**	**30 to 600**
Length, inches	12	14	14	14
Each	**$ .95**	**1.20**	**1.35**	**1.50**



382M4

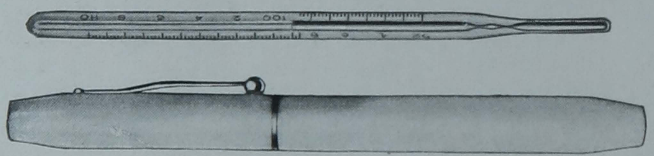
Thermometers, Differential, Beckmann. With auxiliary scale and mercury trap. Total scale range, 5.5° C. graduated in 0.01°. The auxiliary scale adjacent to the reservoir reads from -10 to 140° C. in 2° graduations, and is used for adjusting the mercury column so that the range of 5° on the differential scale will cover the desired temperature. The mercury trap below the reservoir facilitates setting, as it is equipped with a fine glass spout which enables the thermometer to be adjusted drop by drop. The amount of each drop is indicated on the scale, i. e., one drop Hg = 2.1° C. Scale is of milk glass. Total length, including metal cap at top, 56 to 58 cm. Length of stem, 180 mm.; diameter at largest section, 14 to 15 mm.

382M4 Thermometers, Differential, Beckmann. With scale reading upward with zero at bottom. **Each** **$15.00**

382M5 Thermometers, Differential, Beckmann. With scale reading downward with zero at top. **Each** **$15.00**

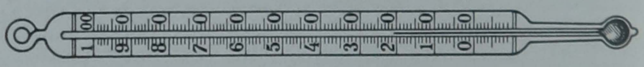
382M6 Thermometers, Differential, Beckmann. Same as 382M4, except with Bureau of Standards Certificate. **Each** . **$30.00**

382M7 Thermometers, Differential, Beckmann. Same as 382M5, except with Bureau of Standards Certificate. **Each** . **$30.00**



382M8

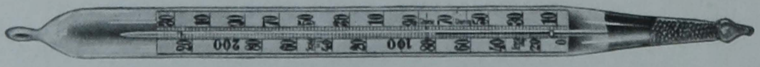
382M8 Thermometers, Fever. Clinical type with bulb, for oral use. The staggered scale is designed for easy reading. The fountain-pen style, white lumarith case has a slip cap with gold-plated clip and band. **Each** **$1.00**



382M9

382M9 Thermometers, Floating, Sugar, Centigrade. Graduations in 1°. Mercury filled; with paper-enclosed scale.

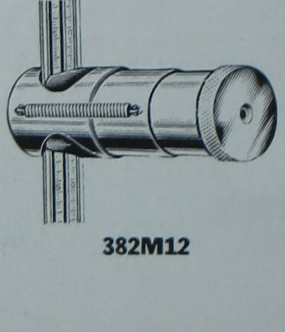
Range, degrees, C.	**0 to 30**	**0 to 50**	**0 to 100**
Length, cm.	15	18	20
Each	**$ .70**	**.75**	**.80**



382M10

382M10 Thermometers, Floating, Dairy. Range, 30° to 220° F. The mercury-filled tube is 8 inches long. **Each** ...... **$ .50**

382M11 Thermometers, Floating, Dairy. Same as 382M10, except with colored liquid. **Each** .... **$ .50**

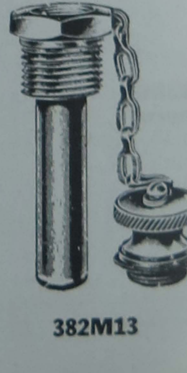


382M12

382M12 Thermometer Readers. For magnifying the divisions on thermometers and burettes. The telescopic barrel contains two reference pointers and is adjustable for focus. The self-closing clamping device exerts three-point contact which permits the reading lens to be slid up or down to the level of the mercury or meniscus without disturbing the focus adjustment. Black lining on the interior of the barrel prevents reflection. Metal parts are of brushed brass coated with durable instrument lacquer. The reader may be affixed to thermometers or burettes from $\frac{3}{16}$ inch (5 mm.) to $\frac{3}{4}$ inch (19 mm.). **Each** **$4.75**

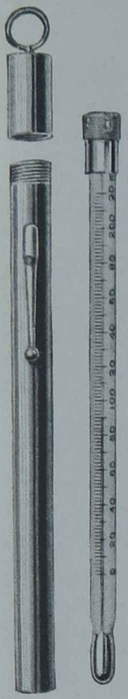
382M13 Thermometer Test Wells, Tag. Used with etched stem thermometers, either bare or armored. Supplied with sealing plug and gasket. S. P. T., $\frac{1}{2}$ inch.

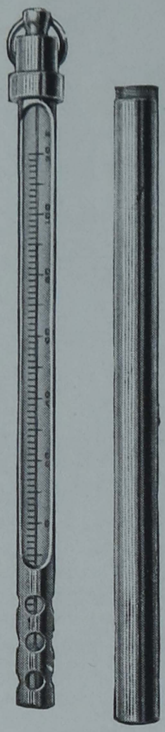
Length below thread, inches	$1\frac{1}{2}$	3	5
Each	**$1.80**	**2.50**	**3.00**

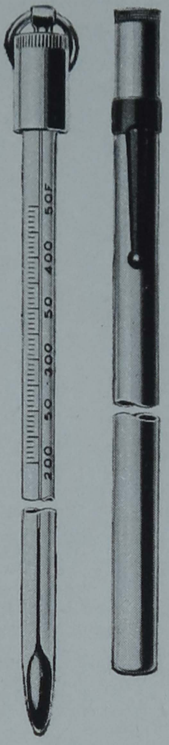


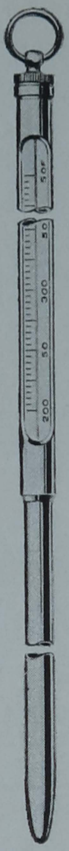
382M13

Thermometers, Continued


383M1


383M3


383M7


383M13

383M1 Thermometers, General Testing, Pocket, Tag Standard Grade. Fahrenheit scale. Etched stem. In white metal case with pocket clip. Length of case, 6 inches. Thermometer No. 51600AS is spirit-filled. Others mercury filled.

Number	**51600A**	**51600AS**	**51602A**	**51605**
Range, deg., F.	-30 to 120	-30 to 120	-30 to 120	0 to 220
Grad., deg., F.	2	2	1	2
Each	**$1.20**	**1.20**	**1.50**	**1.50**

383M2 Replacement Tubes, Only. Length, 5½ inches.

Each	**$1.00**	**1.00**	**1.30**	**1.30**

383M3 Thermometers, Armored, General Testing, Pocket, Tag Standard Grade. Fahrenheit scale. Etched stem. In armor and nickeled case with pocket clip. Mercury filled. Length of case, 7 inches.

Number	**51606**	**51608**	**51610**
Range, degrees, F.	-30 to 120	30 to 120	30 to 220
Graduations, degrees, F.	2	1	2
Each	**$3.50**	**3.50**	**3.50**

383M4 Replacement Tubes, Only. Length, 6½ inches.

Each	**$1.80**	**1.80**	**1.80**

383M5 Thermometers, Maximum Registering, Pocket, Tag Standard Grade. Fahrenheit scale. Etched stem. In white metal case with pocket clip. Length of case, 6 inches.

Number	**51401**	**51407**
Range, degrees, F.	30 to 120	30 to 220
Graduations, degrees, F.	1	2
Each	**$3.00**	**3.00**

383M6 Replacement Tubes, Only. Length, 5½ inches.

Each	**$2.80**	**2.80**

383M7 Thermometers, Asphalt Testing, Pocket, Tag Standard Grade. Range, 100° to 450° F. graduated in 5°. Etched stem; tapered bulb. In metal case with clip. Length of case, 7 inches.

Number	**51616**	**51613**
Bulb	Plain	Copper-Plated
Each	**$3.00**	**3.20**

383M8 Replacement Tubes, Only. Length, 6½ inches.

Each	**$2.50**	**2.70**

383M9 Thermometers, Asphalt Testing, Armored, Pocket, Tag Standard Grade. Range, 100° to 450° F. graduated in 5°. Etched stem. With tapered bulb and removable guard chain and pin. Length of case, 7 inches.

Number	**51504**	**51510**
Bulb	Plain	Copper-Plated
Each	**$4.50**	**5.00**

383M10 Replacement Tubes, Only. Length, 6½ inches.

Each	**$2.50**	**3.00**

383M11 Thermometers, Asphalt, Testing, Armored, Tag Standard Grade. Fahrenheit scale, graduated in 5°. With tapered bulb and removable guard. Length of case, 15 inches.

Number	**51500**	**51506**	**51502**	**51508**
Rge., deg., F.	100 to 450	100 to 450	200 to 650	200 to 650
Bulb	Plain	Copper-Plated	Plain	Copper-Plated
Each	**$5.50**	**6.00**	**6.00**	**6.50**

383M12 Replacement Tubes, Only. Length, 15 inches.

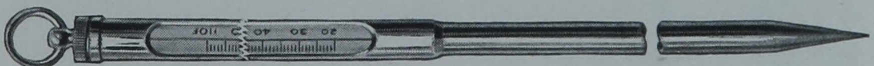
Each	**$3.50**	**4.00**	**3.75**	**4.25**

383M13 Thermometers, Asphalt Testing, Armored, Pocket, Tag Standard Grade. Fahrenheit scale. Graduated in 5°. Etched stem with "bullet-pointed" bulb and mercury conducting bath. Length of case, 11½ inches.

Number	**51512**	**51514**
Range, degrees, F.	100 to 450	200 to 650
Each	**$5.00**	**6.00**

383M14 Replacement Tubes, Only. Length, 11 inches.

Each	**$3.00**	**4.00**


383M15

383M15 Thermometers, Meat and Fruit Testing, Armored, Tag Standard Grade. Fahrenheit scale. Graduated in 1°. Etched stem. With armored sharp conical-pointed bulb made of stainless steel, with mercury conducting bath; spirit-filled. Length of case, 11¾ inches.

Number	**51568**	**51569**
Range, degrees, F.	10 to 120	100 to 220
Each	**$4.00**	**4.00**

383M16 Replacement Tubes, Only. Length, 11 inches.

Each	**$3.00**	**3.00**

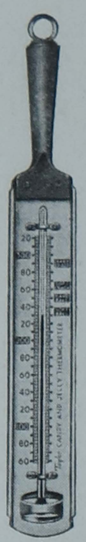
383M17 Thermometers, Meat and Fruit Testing, Pocket, Tag Standard Grade. Fahrenheit scale. Graduated in 1°. Etched stem. With tapered bulb in metal case with clip. Length of case, 7 inches.

Number	**51615**	**51617**
Range, degrees, F.	10 to 120	100 to 220
Each	**$2.30**	**2.30**

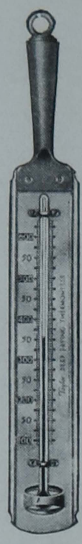
383M18 Replacement Tubes, Only. Length, 6½ inches.

Each	**$1.80**	**1.80**

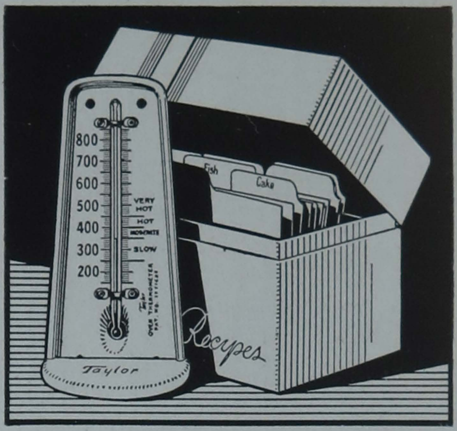
Thermometers, Continued



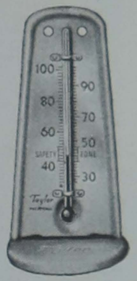
384M1



384M2



384M3



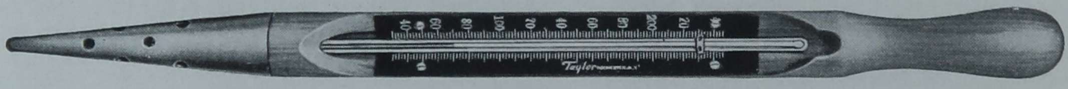
384M4

384M1 Thermometers, Candy and Jelly. Range, approximately 60° to 320° F. Scale is 8 inches long, of nickel silver. Figures and graduations are filled in black. Tube is mercury filled with magnifying lens; wood handle is lacquered, riveted to scale, and has ring pendant at top. Clip on back for attaching to kettle. Overall length, 12¾ inches. **Each**.. **$2.00**

384M2 Thermometers, Deep Fat-Frying. Similar to 384M1, except with range of approximately 100° to 600° F. **Each**.. **$2.00**

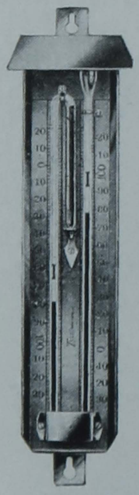
384M3 Thermometers, Oven. Range, approximately 200° to 700° F. Scale is vitreous enamel with figures and graduations in black. Tube is mercury filled with magnifying lens; hooked into scale for accuracy, and assembled permanently with tubular rivets. Base is glazed pottery. Height, 6 inches. **Each**.. **$2.00**

384M4 Thermometers, Refrigerator. Range, approximately 30° to 100° F. Scale is white vitreous enameled with figures and graduations in black, fired in for permanence. Permacolor tube with magnifying lens. The base is glazed pottery. Height, 6 inches. **Each**.................... **$1.50**

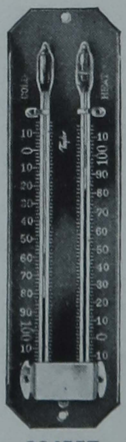


384M5

384M5 Thermometers, Soil. Range, approximately 30° to 180° F. Scale is oxidized brass with white-filled figures and graduations. The magnifying tube is mercury filled. The 15-inch wood case is V-shaped with handle and strong pointed metal end. **Each**.. **$3.50**



384M6



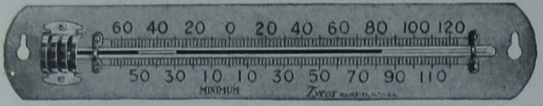
384M7

384M6 Thermometers, Registering, Maximum and Minimum. Sixe's pattern. Range, -40° to 120° F. In setting, the index in each tube is placed on top of the mercury column by means of a magnet. Until reset the instrument will then show what has been the greatest degree of hot or cold. With magnifying lens tube. Scale and case are of one piece lacquered brass. Designed for wall mounting. With setting magnet. **Each**.. **$7.00**

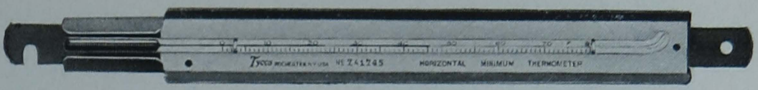
384M7 Thermometers, Registering, Maximum and Minimum. Two-leg type. Setting procedure is same as 384M6. Range, -40° to 140° F. Scale, flanged at sides, is finished black with white figures and graduations. With setting magnet. Length, 7¾ inches. **Each**.. **$4.50**

384M8 Magnets, Only. For 384M6 and 384M7. **Each**.. **$ .60**

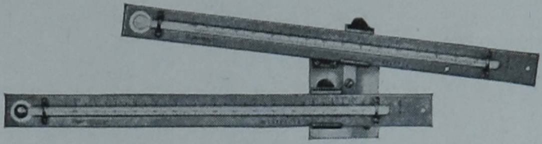
Thermometers, Continued



385M1



385M2



385M6

385M1 Thermometers, Registering, Minimum. Range, -60° to 120° F. Permacolor tube has black index for registering minimum temperature. Scale is made of flanged zinc. Overall length, 10 inches. **Each**........................**$2.50**

385M2 Thermometers, Registering, Minimum. Range, 10° to 80° F. graduated in 1°. Permacolor tube is 10 inches long, with expansion safety chamber. Black index registers minimum temperatures. Scale is made of aluminum and housed in gray enameled case designed for easy reading. Overall length, 13½ inches. **Each**......................**$4.00**

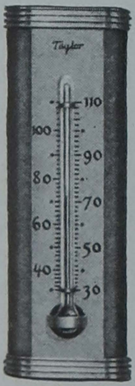
385M3 Thermometers, Registering, Maximum, Weather Bureau Pattern. Range, 20° to 120° F. graduated in 1°. Tube is mercury filled; mounted on stainless steel scale. Made in accordance with U. S. Weather Bureau specifications. **Each**...**$8.00**

385M4 Thermometers, Registering, Minimum, Weather Bureau Pattern. Range, -60° to 120° F. graduated in 1°. Tube is plain, spirit-filled; mounted on stainless steel scale. Made in accordance with U. S. Weather Bureau specifications. **Each**...**$8.00**

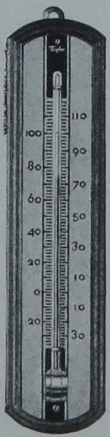
385M5 Supports, Townsend. Brass plate with two studs of unequal height having carriers and locking screws for thermometers. The taller support rotates freely to permit setting of the maximum thermometer after reading. The shorter support makes a quarter turn to enable the minimum thermometer to be set. **Each**........................**$8.00**

385M6 Thermometers, Registering, Maximum and Minimum, Weather Bureau Set. Set consists of one maximum thermometer, 385M3, and one minimum thermometer, 385M4, with metal support, 385M5. **Set**...........**$24.00**

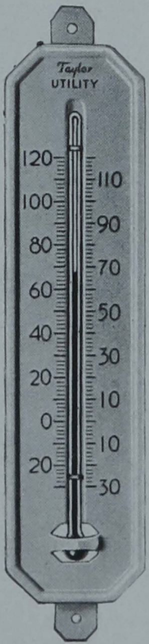
385M7 Thermometers, Weather Bureau Type. Range, -40° to 120° F. Etched, mercury-filled plain-front tube with cylindrical bulb, mounted on 9½-inch stainless steel scale. Tube is graduated in single degrees; scale, five degrees, with the figures every ten degrees. Complete with brass insulating supports and binding screws. **Each**................**$8.00**



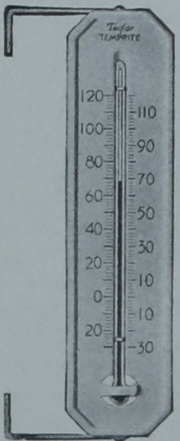
385M8



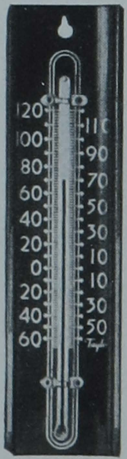
385M9



385M10



385M11



385M12

385M8 Thermometers, Wall Type, Indoor. Range, 27° to 112° F. graduated in 2°. Metal scale with black figures and graduations. With bulb guard and reed bands, ivory-finished back and invisible hanger. Length, 5¼ inches. **Each**........**$2.00**

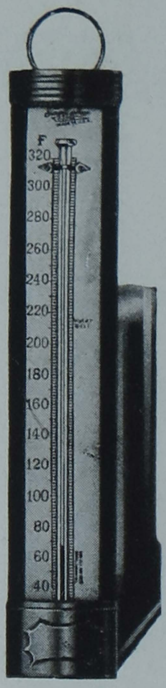
385M9 Thermometers, Wall Type, Outdoor. Range, -30° to 110° F. With permacolor tube and magnifying lens. Scale is of satin-finished brass with black figures and graduations. Ivory-finished back. Length, 8 inches. **Each**................**$1.25**

385M10 Thermometers, Wall Type, Outdoor. Range, -20° to 120° F. With permacolor tube, magnifying lens. The scale is 8½x2 inches, white vitreous enameled. The black figures and graduations are fired in for permanence. **Each**..........**$1.00**

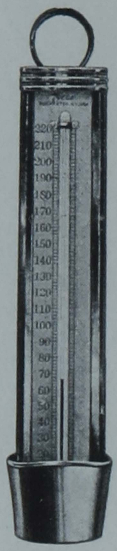
385M11 Thermometers, Window, Outdoor. Range, -30 to 120° F. With permacolor tube and magnifying lens. The scale is 8½x2 inches, white vitreous enameled. The black figures and graduations are fired in for permanence. Complete with mounting brackets. **Each**..**$1.00**

385M12 Thermometers, Outdoor. Range, -60° to 120° F. Permacolor tube has magnifying lens. Scale is black with white figures and graduations. **Each**..**$ .40**

Thermometers, Continued

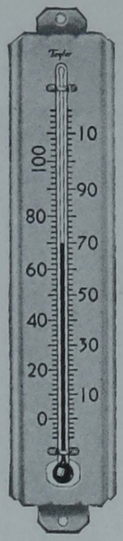


386M1

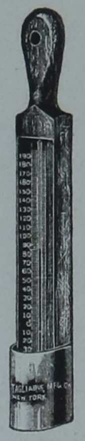


386M5

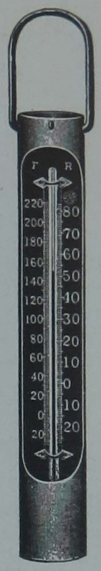
386M6



386M7



386M8



386M11

386M1 Thermometers, Metal Case. Spirit filled. Range, -40° to 120° F.

Length, inches	10	12
Each	**$1.50**	**1.75**

386M2 Thermometers, Metal Case. Range, 0° to 120° F.

Length, inches	10	12
Each	**$1.50**	**1.75**

386M3 Thermometers, Metal Case. Range, -10° to 220° F. Length, 12 inches. **Each** **$1.75**

386M4 Thermometers, Metal Case. Graduated to 100° C. **Each** **$1.25**

386M5 Thermometers, Copper Cup Case. Range, 30° to 220° F. Scale is silver plated. Length, 12 inches. **Each** **$3.75**

386M6 Thermometers, Refrigeration. Range, -20° to 120° F. Length, 12 inches; diameter, 1¼ inches. Galvanized iron case with rubber bumpers. **Each** **$2.50**

386M7 Thermometers, Cold Storage Room, Wall Type. With wide reading permacolor tube. 12 inches long. Mounting lugs top and bottom. Rolled edge flanges for protection of tube. Stainless steel clasps.

Range, degrees, F.	**-40 to 75**	**-40 to 120**
Graduations degrees	1	2
Each	**$2.00**	**2.00**

386M8 Thermometers, Cup Case, Tank. Metal scale; wood back with brass cup.

Number	**57160**	**57161**	**57162**	**57165**	**57166**	**57167**
Range, degrees, F.	-20 to 120	-20 to 120	-20 to 120	20 to 220	20 to 220	20 to 220
Length, inches	8	10	12	8	10	12
Each	**$1.05**	**1.50**	**2.00**	**1.05**	**1.50**	**2.00**

Note. Thermometers, 386M8, can be supplied with red back at no additional charge. When ordering specify "Red Back" after number.

386M9 Thermometers, Cup Case, Tank, Etched Stem. No metal scale. Otherwise, same as 386M8.

Number	**57200**	**57202**	**57204**	**57210**	**57212**	**57214**
Range, degrees, F.	-20 to 120	-20 to 120	-20 to 120	20 to 220	20 to 220	20 to 220
Length, inches	8	10	12	8	10	12
Each	**$1.38**	**1.84**	**2.34**	**1.38**	**1.84**	**2.34**

386M10 Thermometer Tubes, Only. For 386M9. **Each** . . . . . **$ .80** **1.25** **1.75** **.80** **1.25** **1.75**

386M11 Thermometers, Cup Case, Cylindrical. With metal scale and case.

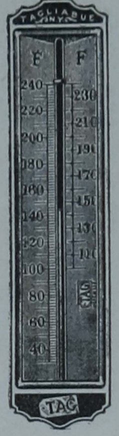
Number	**8669**	**8670**	**8671**	**8672**
Range, degrees, F.	-20 to 120	-20 to 120	20 to 220	20 to 220
Length, inches	10	12	10	12
Diameter, inches	1	1¾	1	1¾
Each	**$2.00**	**3.25**	**2.00**	**3.25**

386M12 Thermometer Scales and Tubes. For 386M11. **Each** **$1.00** **1.25** **1.00** **1.25**

Thermometers, Industrial

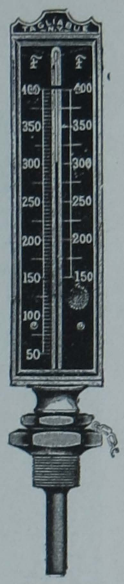
387M1

387M2



Front View
387M6

Side View
387M6



387M3

Thermometers, Industrial, Fixed Connection, Tag. Without extension neck. Stem length, 2½ inches. ¾-inch S. P. T.

Range, degrees, F..			-40 to 110	30 to 160	30 to 240	0 to 300	50 to 400	150 to 750
387M1 Straight Form.	With 12-inch scale case.	**Each**	**$15.34**	**15.34**	**15.34**	**15.34**	**15.34**	**15.34**
	9-inch scale case.	**Each**	**$12.67**	**12.67**	**12.67**	**12.67**	**12.67**	**12.67**
	7-inch scale case.	**Each**	**$10.00**	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**
387M2 Angle Form.	With 12-inch scale case.	**Each**	**$18.00**	**18.00**	**18.00**	**18.00**	**18.00**	**18.00**
	9-inch scale case.	**Each**	**$15.34**	**15.34**	**15.34**	**15.34**	**15.34**	**15.34**
	7-inch scale case.	**Each**	**$12.67**	**12.67**	**12.67**	**12.67**	**12.67**	**12.67**

Thermometers, Industrial, Union Connection, Tag. Without extension neck. Stem length, 2½ inches. One-inch S. P. T.

Range, degrees, F.			-40 to 110	30 to 160	30 to 240	0 to 300	50 to 400	150 to 750
387M3 Straight Form.	With 12-inch scale case.	**Each**	**$18.00**	**18.00**	**18.00**	**18.00**	**18.00**	**18.00**
	9-inch scale case.	**Each**	**$15.34**	**15.34**	**15.34**	**15.34**	**15.34**	**15.34**
	7-inch scale case.	**Each**	**$12.67**	**12.67**	**12.67**	**12.67**	**12.67**	**12.67**
387M4 Angle Form.	With 12-inch scale case.	**Each**	**$20.67**	**20.67**	**20.67**	**20.67**	**20.67**	**20.67**
	9-inch scale case.	**Each**	**$18.00**	**18.00**	**18.00**	**18.00**	**18.00**	**18.00**
	7-inch scale case.	**Each**	**$15.34**	**15.34**	**15.34**	**15.34**	**15.34**	**15.34**

Thermometers, Industrial, With Separable Socket, Tag. Without extension neck. Stem length, 2½ inches. One-inch S. P. T.

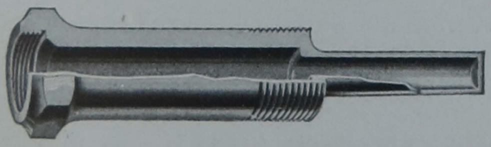
Range, degrees, F.			-40 to 110	30 to 160	30 to 240	0 to 300	50 to 400	150 to 750
387M5 Straight Form.	With 12-inch scale case.	**Each**	**$20.67**	**20.67**	**20.67**	**20.67**	**20.67**	**20.67**
	9-inch scale case.	**Each**	**$18.00**	**18.00**	**18.00**	**18.00**	**18.00**	**18.00**
	7-inch scale case.	**Each**	**$15.34**	**15.34**	**15.34**	**15.34**	**15.34**	**15.34**
387M6 Angle Form.	With 12-inch scale case.	**Each**	**$23.34**	**23.34**	**23.34**	**23.34**	**23.34**	**23.34**
	9-inch scale case.	**Each**	**$20.67**	**20.67**	**20.67**	**20.67**	**20.67**	**20.67**
	7-inch scale case.	**Each**	**$18.00**	**18.00**	**18.00**	**18.00**	**18.00**	**18.00**

Thermometers, Industrial, Union Connection, Tag. With 2-inch extension neck. Stem length, 3 inches. One-inch S. P. T.

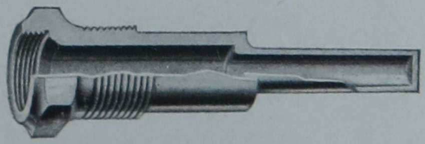
Range, degrees, F.			-40 to 110	30 to 160	30 to 240	0 to 300	50 to 400	150 to 750
387M7 Straight Form.	With 12-inch scale case.	**Each**	**$20.34**	**20.34**	**20.34**	**20.34**	**20.34**	**20.34**
	9-inch scale case.	**Each**	**$17.67**	**17.67**	**17.67**	**17.67**	**17.67**	**17.67**
	7-inch scale case.	**Each**	**$15.00**	**15.00**	**15.00**	**15.00**	**15.00**	**15.00**
387M8 Angle Form.	With 12-inch scale case.	**Each**	**$23.00**	**23.00**	**23.00**	**23.00**	**23.00**	**23.00**
	9-inch scale case.	**Each**	**$20.34**	**20.34**	**20.34**	**20.34**	**20.34**	**20.34**
	7-inch scale case.	**Each**	**$17.67**	**17.67**	**17.67**	**17.67**	**17.67**	**17.67**

Thermometers, Industrial, With Separable Socket, Tag. With 2-inch extension neck. Stem length, 3 inches. One-inch S. P. T.

Range, degrees, F.			-40 to 110	30 to 160	30 to 240	0 to 300	50 to 400	150 to 750
387M9 Straight Form.	With 12-inch scale case.	**Each**	**$23.67**	**23.67**	**23.67**	**23.67**	**23.67**	**23.67**
	9-inch scale case.	**Each**	**$21.00**	**21.00**	**21.00**	**21.00**	**21.00**	**21.00**
	7-inch scale case.	**Each**	**$18.34**	**18.34**	**18.34**	**18.34**	**18.34**	**18.34**
387M10 Angle Form.	With 12-inch scale case.	**Each**	**$26.34**	**26.34**	**26.34**	**26.34**	**26.34**	**26.34**
	9-inch scale case.	**Each**	**$23.67**	**23.67**	**23.67**	**23.67**	**23.67**	**23.67**
	7-inch scale case.	**Each**	**$21.00**	**21.00**	**21.00**	**21.00**	**21.00**	**21.00**



387M11 with Extension Neck



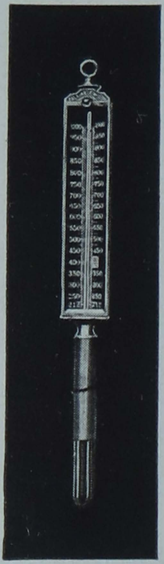
387M11 without Extension Neck

387M11 Separable Sockets. Can be supplied in various lengths with standard pipe threads. Furnished in brass, steel, cast iron and Monel metal. Prices on application.

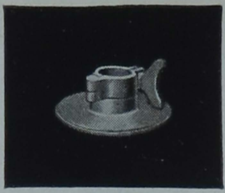
Note: The above thermometers can be furnished in other stem lengths and with various lengths of extension neck.

Write for catalog of complete line of Tag industrial thermometers.

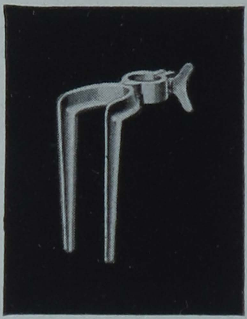
Thermometers, Industrial, Continued



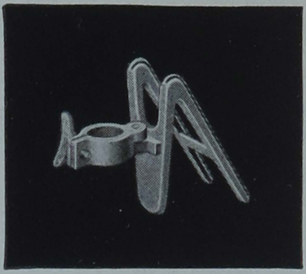
388M1



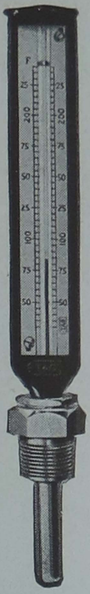
388M2



388M3



388M4



388M5—Straight

388M1 Thermometers, Industrial, Flue Gas. Range 200° to 1000° F. For testing flue gas, oil tempering baths, etc. Straight form. Stem made of steel; length, 30 inches. Length of case, 12 inches. **Each**.. **$33.00**

388M2 Adjustable connections. Straight flange. Specify diameter of thermometer stem. **Each**.................... **$3.00**

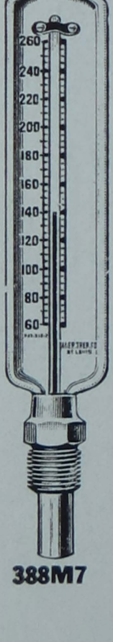
388M3 Adjustable Connections. For supporting the thermometer by hooking the clamp over the apparatus or over a bar across the top. Specify diameter of thermometer stem. **Each**.. **$3.00**

388M4 Adjustable Connections. Double prong clamp hook to hold thermometer with its entire stem away from the side of the apparatus. Specify diameter of thermometer stem. **Each**.. **$4.00**

Thermometers, Industrial, Molded Case, Tag. Fahrenheit scale. For Diesel engines, refrigerator equipment and other applications where light weight and corrosion-proof construction are important. The molded case is so designed that the instrument will withstand the most severe vibration and shock. The use of the red reading column with silvered background greatly increases readability.

The scale case is 7 inches long, 1¼ inches wide and one inch deep. Length of the scale opening, 6⅛ inches; S. P. T., ¾ inch. Stem length below thread, 2 inches. Socket length, 3¼ inches.

Number	**8851**	**8852**	**8861**	**8862**
Form	Straight	Straight	Angle	Angle
Stem material	Monel	Brass	Monel	Brass
388M5 Thermometers, Molded Case. Range, 30° to 240° F. **Each**	**$6.56**	**5.44**	**8.25**	**7.13**
388M6 Thermometers, Molded Case. Range, 200° to 500° F. **Each**	**$6.56**	**5.44**	**8.25**	**7.13**



388M7

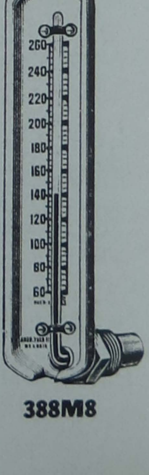
388M7 Thermometers, Industrial, Hot Water, with Straight Stem. Range, 40° to 260° F. The frame is made of iron, finished in porcelain enamel, with stud threaded for ¾-inch pipe. A set screw permits rotating the instrument in the proper position for convenient reading. The graduations, figures and letters are fused into the porcelain enamel. Dimensions: 6½x1⅝ inches. **Each**.. **$1.00**

388M8 Thermometers, Industrial, Hot Water, with Angle Stem. Otherwise same as 388M7. **Each**.. **$1.25**

Note: 388M7 and 388M8 can be supplied with special length stems up to 12 inches below the thread. Prices on application.

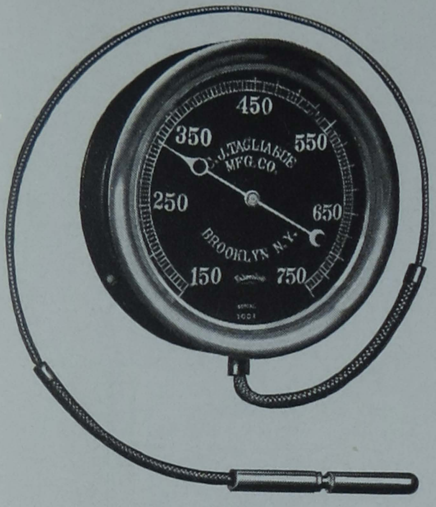
388M9 Thermometers, Industrial, Brine, with Straight Stem. Similar to 388M7. With range of -20° to 120° F. Accurate within one degree plus or minus. **Each. $2.75**

388M10 Thermometers, Industrial, Brine, with Angle Stem. Otherwise, same as 388M9. **Each**.. **$3.00**



388M8

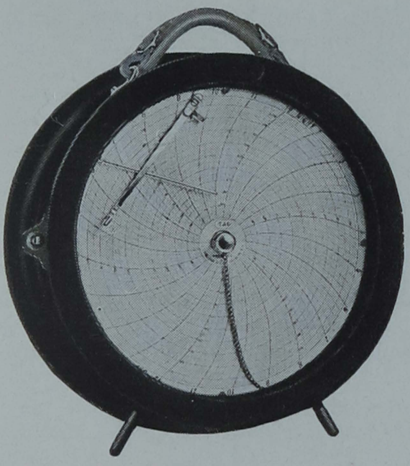
Thermometers, Industrial, Continued



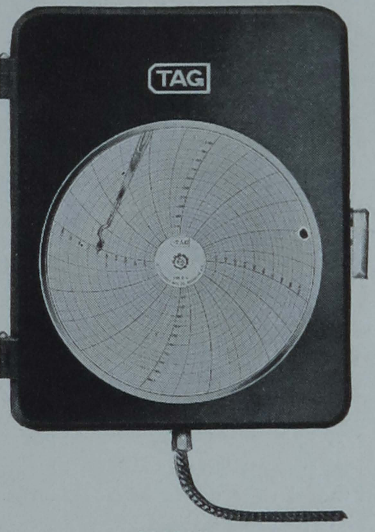
389M1

Thermometers, Industrial, Dial-Indicating, Mercury-Filled, Tag. Fahrenheit. For general use. The white pointer on the black dial facilitates reading. The case is black japanned iron with nickel-plated brass ring for wall mounting. Complete with 5 feet of regular flexible connecting tubing and 4-inch plain bulb. ¾ inch S. P. T.

Range, degrees, F.	-40 to 110	0 to 100	0 to 150	200 to 350	0 to 1000	250 to 1000
389M1 5-Inch. **Each**	**$32.00**	**32.00**	**32.00**	**32.00**	**41.00**	**41.00**
389M2 6-Inch. **Each**	**$37.00**	**37.00**	**37.00**	**37.00**	**46.00**	**46.00**
389M3 8-Inch. **Each**	**$50.00**	**50.00**	**50.00**	**50.00**	**59.00**	**59.00**



389M4



389M5

TAG
Recorder
Ink
RED

389M9

389M4 Thermometers, Industrial, Recording, Self-Contained, Tag. Fahrenheit. Portable. The mechanism is inside a round, moisture- and dust-proof, black enameled steel case; the 4-inch bulb is outside. S. P. T., ¾ inch. The chart is for 24-hour recording, and is 10 inches in diameter. Complete with plain bulb, 5 feet of connecting tubing, 100 charts, ink and handle.

Range, degrees, F.	-40 to 55	0 to 110
Each	**$86.00**	**86.00**

Thermometers, Industrial, Recording, Tag. Fahrenheit. Uses 9-inch charts and has 3$\frac{5}{16}$-inch pen travel. The case is rectangular, weather-proof, black-enameled aluminum; dimensions, 12¾ inches high by 10¼ inches wide; with 4-inch bulb. S. P. T., ¾ inch. Chart for 24-hour recording. Spring wound, or electric clock (110 V. 60 cycle). Complete with plain bulb, 5 feet of flexible connecting tubing, 100 charts and ink.

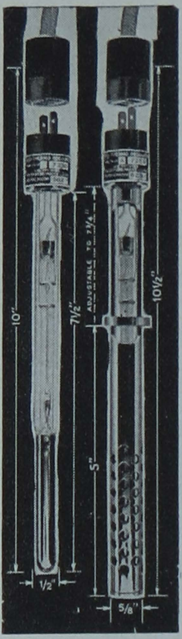
Range, degrees, F.	-60 to 110	30 to 220	100 to 350	100 to 500	200 to 900
389M5 Thermometers, Mercury Actuated, Back Connected. **Each**	**$79.50**	**79.50**	**79.50**	**79.50**	**88.50**
389M6 Thermometers, Mercury Actuated, Bottom Connected. **Each**	**$79.50**	**79.50**	**79.50**	**79.50**	**79.50**
389M7 Thermometers, Mercury Actuated, Fully Compensated, Back Connected. **Each**	**$94.50**	**94.50**	**94.50**	**94.50**	**94.50**
389M8 Thermometers, Mercury Actuated, Fully Compensated, Bottom Connected. **Each**	**$94.50**	**94.50**	**94.50**	**94.50**	**94.50**

389M9 Recorder Ink, Red. For use with Tag recorders. Easy-flowing, non-corrosive, and unaffected by temperature changes.

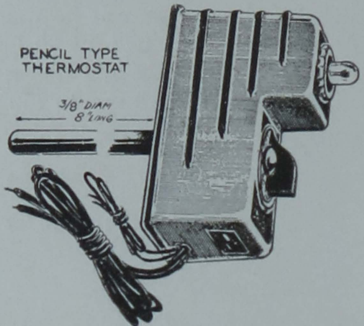
Size of bottle	1 oz.	½ pt.	1 pt.	1 qt.
Each	**$ .40**	**1.50**	**2.80**	**5.00**

Write for catalog of complete line of Tag recording thermometers.

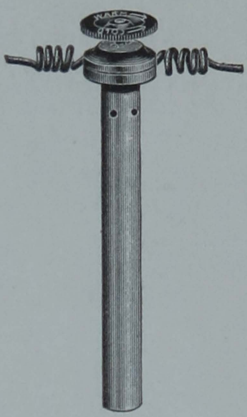
Thermo-Regulators



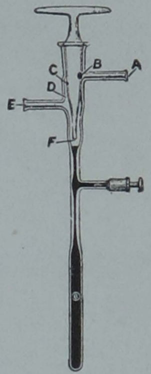
390M1 & 390M2



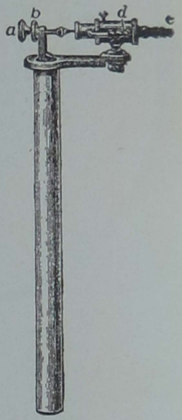
390M4



390M5



390M6



390M7

390M1 Thermo-Regulators, Mercury, "Red Top." For accurately controlling constant temperature of ovens, heating baths, refrigerators, rooms, incubators, etc. Adjustable and can be set or reset at any desired temperature between -34° C. and 260° C. (-30° F. and 500° F.) and accurate to 1/10 of 1° F. 10½ inches long overall. Requires a 390M3 sensitive relay.
Each, without relay. **$12.75**

390M2 Thermo-Regulators, Mercury, "Red Top." Same as 390M1, except with protecting armor. **Each**. **$14.75**

390M3 Sensitive Relays. (Not illustrated.) For use with 390M1 and 390M2 thermo-regulators. Capacity, 500 watts, 5 amperes on 110 volts A. C. or 2½ amperes on 220 volts. With wiring diagram. **Each**. **$8.00**

390M4 Thermo-Regulators, Electric. For regulating the temperature of drying ovens, etc., also for immersion in liquids. The thermal element is an invar rod in a closed brass tube, 8 inches long by ⅜-inch diameter. The contacts are of electrolytic silver and of generous size. A neon pilot light is mounted on the aluminum housing. Temperature adjustment is made with the Bakelite knob.

Temperature range is 260° C. (500° F.); temperature differential, 1° F. Rating 2000 watts A. C. or 900 watts D. C., (no relay needed).

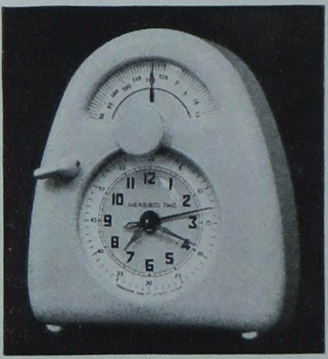
Complete with external condenser, asbestos-covered nickel wire for pilot light connections and heavier wire of same type for current connections. **Each**. **$20.00**

390M5 Thermo-Regulators, Electric, Pencil Type. For regulating the temperature of liquids in water baths, etc., between the range of 30° to 100° C. The thin metal tube contains a sensitive bi-metallic bar, extending halfway up the tube, and a condenser for the prevention of arcing between the contact points, providing the electric current does not exceed 165 watts on 110 volts. The tube is hermetically closed at the bottom, 6 inches long, and ¾ inch in diameter. Complete with a removable regulator key. **Each**. **$11.50**

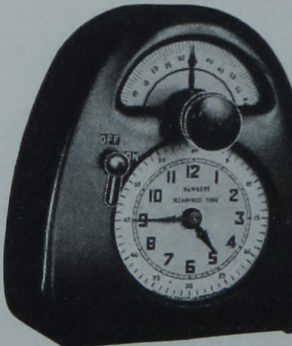
390M6 Thermo-Regulators, Gas Flame, Mercury Operated, Reichert. For controlling gas burner flames by regulating the effective area of the gas admitting orifice. Provided with adjustable by-pass for permanent pilot flame or complete shut-off. Adjustable within ⅕° C. of any desired temperature to 300° C. by threaded iron mercury displacement screw. Overall length, 13 inches. **Each**. **$8.00**

390M7 Thermo-Regulators, Gas Flame, Bi-Metallic, Roux. For maintaining a set temperature in incubators and ovens up to 80° C. Controls gas burner flames by means of a bi-metallic bar operating the piston of a gas valve through an adjustable pressure screw. A by-pass is provided for maintaining a pilot flame. Made entirely of metal. Diameter of tube, 13/16 inch; length, 10 inches. **Each**. **$10.00**

390M8 Thermo-Regulators, Gas Flame, Bi-Metallic, Roux. Similar to 390M7, except for maintaining a set temperature in ovens and sterilizers up to 215° C. Tube is 8 inches long and 1 inch in diameter with ¼-inch I. P. S. removable nipple.
Each. **$18.00**



390M9



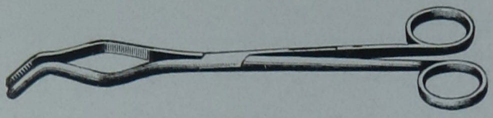
390M10

390M9 Timers, Interval, Electric. For timing intervals from one second to two hours. Equipped with large interval dial graduated from 1 to 120 minutes, and small 12-hour clock dial with sweep second hand. The timer operates a signal adjustable for volume and duration that may be shut off and the timer utilized as a laboratory clock. Case is moulded plastic, 6x5½x2½ inches, with suspension hook for hanging on wall. For standard 110-volt 60-cycle A. C. only.
Each. **$9.50**

390M10 Timers, Interval, Spring Powered. For timing intervals from one to ninety minutes. With large dial graduated from one to ninety minutes and small 12-hour clock dial without second hand. Similar in operation to 390M9, except spring powered. **Each**. **$4.95**

Note: For other timers and stopwatches, see pages 285 and 265.

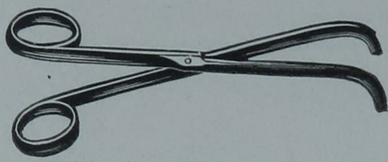
Tongs



391M1

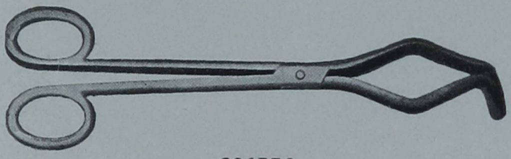
391M1 Tongs, Crucible, Double Bent, Nickel-Plated Steel. With lock joint and corrugated jaws. Length, 9½ inches. **Each** .... **$ .90**

391M2 Tongs, Crucible, Double Bent, Solid Monel Metal. With lock joint and corrugated jaws. Length, 9½ inches. **Each** **$4.75**



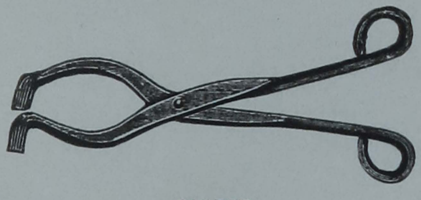
391M3

391M3 Tongs, Crucible, Single Bent. With lock joint and corrugated jaws. Length, 9 inches. **Each** .... **$ .90**



391M4

391M4 Tongs, Crucible, Double Bent. With platinum tips. Solid Monel metal with lock joint and hollow platinum shoes (tips). Length, 9 inches. **Each** **$14.75**



391M5

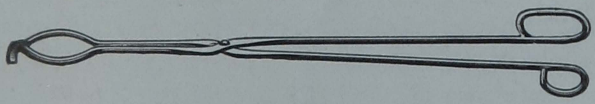
391M5 Tongs, Crucible, Double Bent, Steel. With rivet joint. Length, 9 inches. **Each** .... **$ .24**

391M6 Tongs, Crucible, Double Bent, Solid Aluminum. With rivet joint. Length, 8 inches. **Each** .... **$ .75**

391M7 Tongs, Crucible, Double Bent, Solid Monel Metal. With rivet joint. Length, 9 inches. **Each** **$1.00**

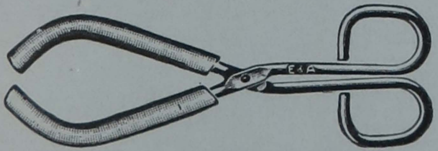
391M8 Tongs, Crucible, Double Bent, Solid Nickel. With rivet joint. Length, 9 inches. **Each** **$1.20**

391M9 Tongs, Crucible, Double Bent, Solid Chromel (Nichrome) Metal. With rivet joint. Length, 9 inches. **Each** **$3.00**



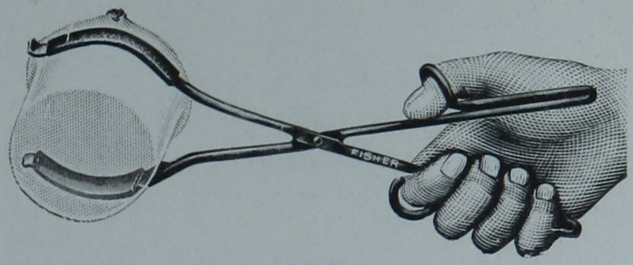
391M10

391M10 Tongs, Crucible, Double Bent, Nickel-Plated Steel. With rivet joint. Length, 18 inches. **Each** **$2.00**



391M11

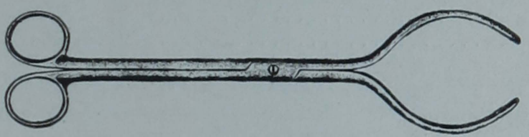
391M11 Tongs, Beaker, Craig Beak-Tong, Nickel-Plated Steel. Flat riveted joint and rubber-covered jaws. For beakers from 50 to 2000 ml. capacity. Length, 9 inches. **Each** .... **$ .65**



391M12

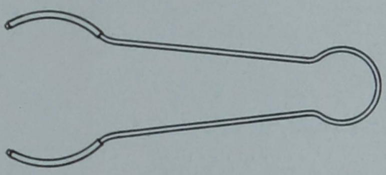
391M12 Tongs, Beaker, Stainless Steel. For beakers from 100 to 1500 ml. capacity. With asbestos-covered jaws. Length, overall, 13 inches. **Each** **$1.50**

391M13 Asbestos Sleeves, Only. For 391M12. **Pair** .. **$ .20**



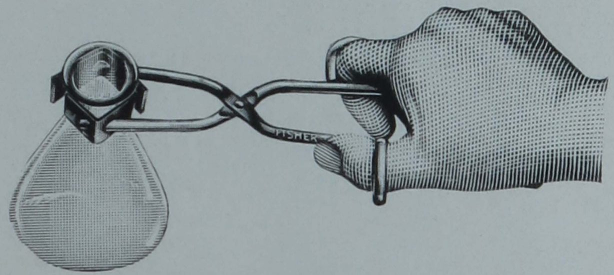
391M14

391M14 Tongs, Beaker, Nickel-Plated Steel. With lock joint. For beakers from 100 to 600 ml. capacity. Length, 8½ inches. **Each** **$1.80**



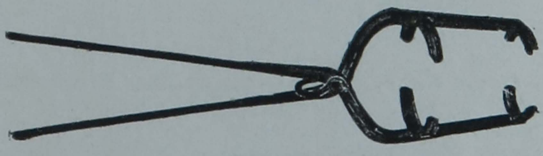
391M15

391M15 Tongs, Beaker. Self-opening jaws. Made of flat spring steel, black enameled with rubber-covered jaws. For beakers up to 800 ml. capacity. Length, 12 inches. **Each** .... **$ .40**



391M16

391M16 Tongs, Flask, Stainless Steel. With "V" jaws giving a strong grip on the neck of Florence or Erlenmeyer flasks taking No. 4 to No. 10 rubber stoppers. **Each** . . . **$1.50**



391M17

Tongs, Crucible Steel. For lifting black-lead or Tercod crucibles. Large sizes fitted with ring for use with a crane.

391M17 Tongs. For crucibles Nos. 10 to 20. **Each** . **$ 7.00**

391M18 Tongs. For crucibles Nos. 25 to 35. **Each** . **$10.00**

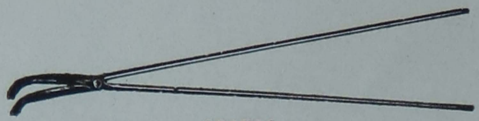
391M19 Tongs. For crucible No. 45. **Each** **$12.00**

391M20 Tongs. For crucible No. 50. **Each** **$14.00**

391M21 Tongs. For crucibles Nos. 60 to 100 **Each** . **$16.00**

391M22 Tongs. For crucibles Nos. 125 to 150. **Each** **$18.00**

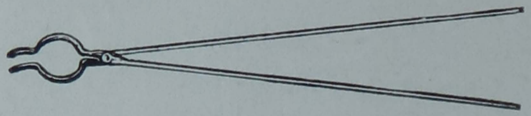
Tools, Assayers'



392M1

392M1 Crucible Tongs, Single Bent, Steel.

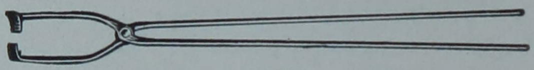
Length, inches	30	36
Each	**$2.25**	**2.25**



392M2

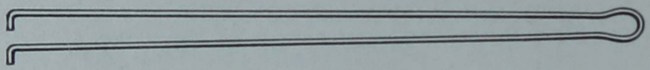
392M2 Crucible Tongs, Double Bent, Steel.

Length, inches	30	36
Each	**$2.50**	**2.50**



392M3

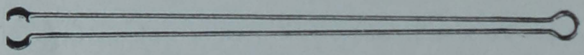
392M3 Crucible Tongs, Double Bent, Steel. For lifting crucibles vertically. Will fit 5-gram to 30-gram crucibles. Larger sizes made to order. Length, 36 inches. **Each** . . **$3.00**



392M4

392M4 Cupel Tongs, Steel.

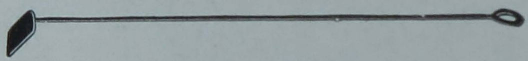
Length, inches	30	36
Each	**$1.50**	**1.50**



392M5

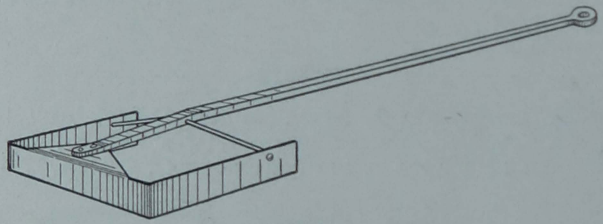
392M5 Cupel Tongs, Steel. Flat round ends.

Length, inches	30	36
Each	**$1.50**	**1.50**



392M6

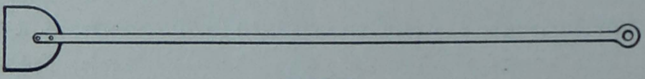
392M6 Muffle Scrapers, Steel. For scraping floor of muffle. Also for moving cupels in the muffle. Length, 36 inches. **Each** **$1.00**



392M7

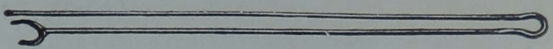
392M7 Cupel Rakes, Steel, Massco. Used to remove cupels from muffle by bringing charge forward onto a cupel board or cupel shovel. Length, 36 inches.

For cupels, size, inches	**1¼**	**1½**
Capacity, cupels	24	36
Width, inches	8	9¼
Each	**$4.00**	**4.50**



392M8

392M8 Muffle Shovels, Steel. For spreading bone ash on muffle floor and for adding reagents to crucibles. Also used to clean and scrape slag from muffle walls and roof. Length, 36 inches. **Each** **$1.00**



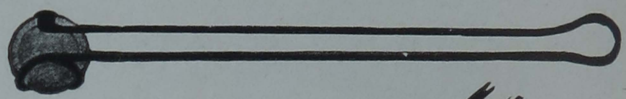
392M9

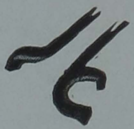
392M9 Scorifier and Crucible Tongs, Steel.

Length, inches	30	36
Each	**$1.50**	**1.50**

392M10 Crucible Tongs. Similar to 392M9, except made especially for handling crucibles. Carefully fitted for crucible size specified. Length, 36 inches.

For crucibles, grams	12	15	20	30
Each	**$2.00**	**2.00**	**2.00**	**2.00**

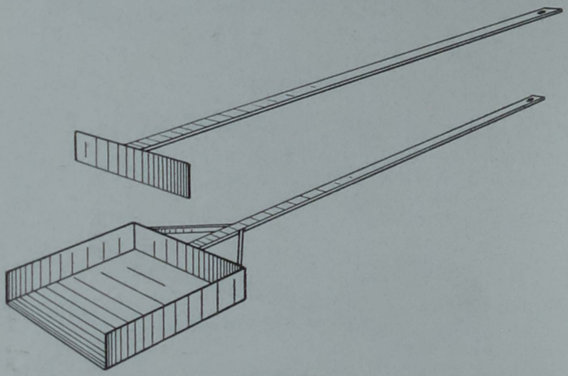




392M11

392M11 Scorifier Tongs, Steel. Will handle all sizes of scorifiers and roasting dishes from 1 to 6 inches with no danger of slipping. The contents of the vessel may be poured without releasing the grip of the tongs.

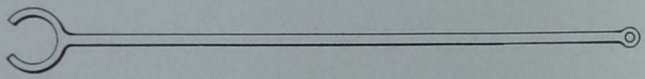
Length, inches	30	36
Each	**$2.50**	**2.50**



392M12

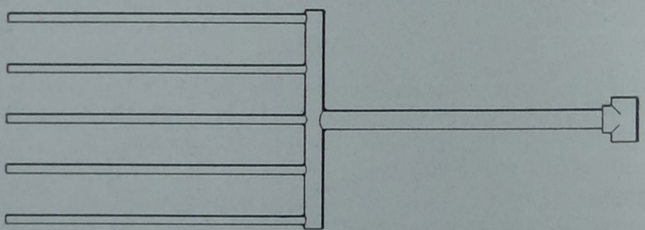
392M12 Cupel Shovels, Steel, Massco. Used to place entire charge of cupels in the muffle in one operation by withdrawing the shovel while the rake holds cupels in place. Complete with T-shape rake. Length overall, 36 inches.

For cupels, size, inches	**1¼**	**1½**
Capacity, cupels	24	36
Width, inches	8	9¼
Each	**$4.50**	**5.00**



392M13

392M13 Crucible Forks, Single, Steel. Will handle crucibles up to 30 grams in size. Length, 40 inches. **Each** . . **$1.50**

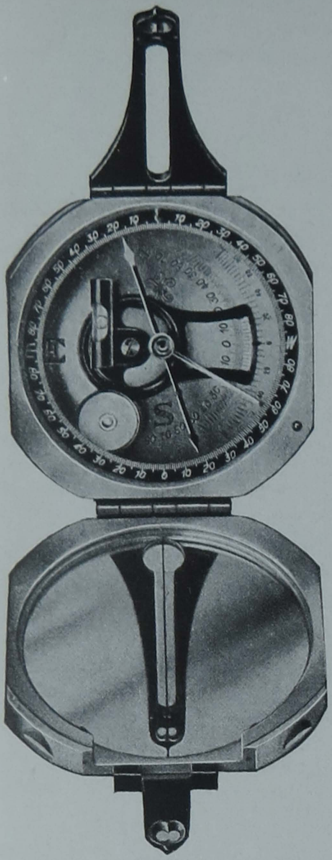


392M14

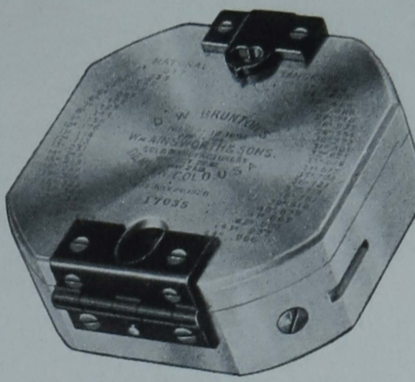
392M14 Crucible Forks, Multiple, Steel. Used to handle entire crucible charge in or out of muffle. Length, overall, 36 inches; width, 12 inches.

For crucibles, size, grams	**15**	**20**
Capacity, crucibles	24	20
Each	**$4.00**	**4.50**

Transits



393M1
Instrument Opened
Showing Details



View Showing Instrument Closed

Transits, Brunton, Patent Pocket. A convenient compact and accurate pocket instrument made for preliminary surveying on the surface and underground for the use of civil, mining and military engineers, surveyors, geologists, mine managers and foremen, and has combined in one convenient pocket instrument the sight or prismatic compass, the clinometer and the hand level.

For taking horizontal angles or courses the instrument is opened up and held level, with the mirror lined lid at about 45 degrees with the case and with the line bisecting the slot in the reflected sight and the image of the station or point sighted. The north end of the needle will indicate on the compass circle the angle east or west of the north or south point when taking bearings or the azimuth when reading azimuths.

Another method of taking horizontal angles is by using the instrument as a prismatic compass when the instrument is held at the level of the eye with the mirror at an angle of 45 degrees with the case. The station or point is sighted through the sight and opening in the cover and the reading of the needle taken in the mirror in which the levels also may be viewed so that the instrument may be held level when sighting. Used in this manner the south end of the needle should be read to obtain the true course.

Vertical angles above or below the horizontal are taken by holding the case of the instrument in a vertical plane, with the cover folded so that the mirror will reflect the interior of the case in which the level bubble on the clinometer vernier may be read. Sighting a station or point through the peep sight on the end of the sight bar, which is folded outward and parallel with the case, with the sighting end turned at right angles thereto, and through the opening in the mirror, the vernier, by means of the level at the back of the case, is turned until the level bubble stands central when the cover may be opened and the angle or grade read from the vernier.

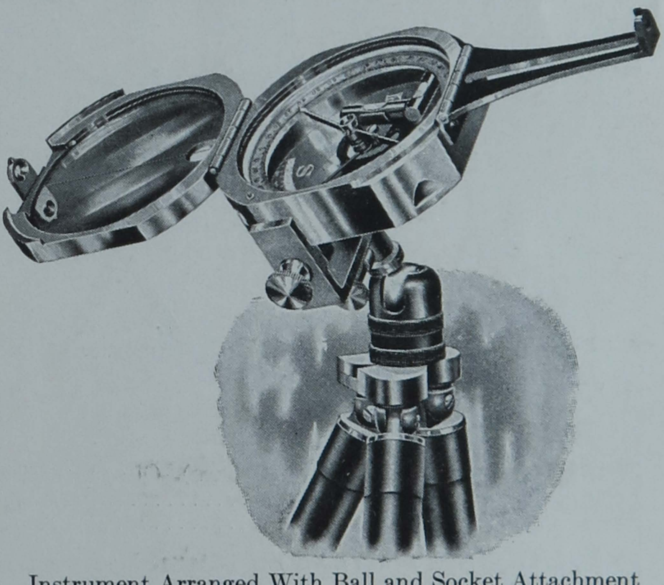
By opening the lid parallel with the case the sides constitute a straight edge parallel with the sight line when the instrument may be used as a level, clinometer or plumb. For taking the angle of strata or veins it may be held against the formation at a distance by sighting across the instrument at the line of demarcation.

For use on a plane table, a celluloid alidade protractor into which the instrument fits, can be supplied, having an 8-inch ruling edge with degree graduations on the remaining three edges. Sighting is performed in the same manner as when using the instrument for taking horizontal angles or courses, which enables the operator to work in a comfortable attitude, as sighting and line drawing may be accomplished without changing position.

When greater accuracy is desired, the instrument may be used on a light camera tripod for which purpose a ball and socket tripod attachment head is available. When on the tripod, by using the cover sight, long tangents may be run independently of the needle and fore and back sights taken from either end of the instrument.

The instrument may also be used for vein tracing by mounting it on the tripod and setting the instrument in the plane of the vein (dip and strike) when, by revolving the instrument in this plane, the outcropping of a vein may be traced over rough or irregular country and stakes set along the vein.

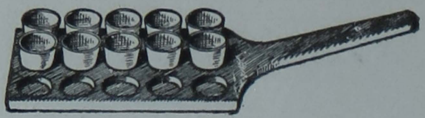
Unless otherwise specified, the instrument is provided with compass circle numbered in quadrants (0-90 each way) from which bearings from the north or south point may be read, but compass circles numbered from 0- 360 counter clockwise for reading azimuths will be supplied if desired.



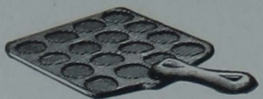
Instrument Arranged With Ball and Socket Attachment Head and Tripod for Vein Tracing

The case of the instrument is of aluminum alloy and when closed, measures 2¾x2¾x1⅛ inches and weighs eight ounces. A special bulletin descriptive of the instrument and its uses and showing how it should be held in the hands to secure the best results is furnished with the instrument.

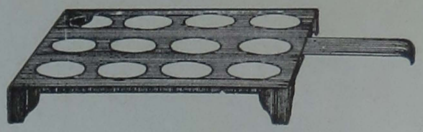
393M1 Transits, Brunton. Instrument only. **Each**	**$30.00**
393M2 Ball and Socket Attachment Head. Adapting instrument for use on tripod. **Each**	**$6.00**
393M3 Tubular Extension Tripod. (Non-magnetic). **Each**	**$8.00**
393M4 Alidade Protractor. Each	**$2.50**
393M5 Belt Loop Leather Case. For 393M1. **Each**	**$2.50**
393M6 Sling Strap Leather Case. For 393M1. **Each**	**$3.00**
393M7 Leather Case with Sling Strap. For 393M1, 393M2 and 393M3. **Each**	**$6.00**



394M1



394M3



394M4

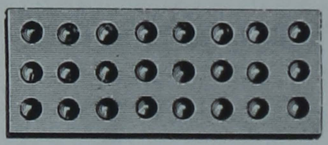
394M1 Trays, Annealing Cup, Clay. For handling annealing cups in muffles. Reinforced handles. Will hold 15 cups. **Each** $1.35

394M2 Trays, Annealing Cup, Aluminum. Of heavy aluminum stock with 20 holes for the size of cup to be used. Equipped with heavy wire handle. When ordering specify diameter of hole or size of cups used. Furnished on special order only.

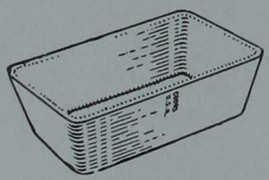
394M3 Trays, Cupel. 16-holes. Of cast iron, with detachable handle. Size, 7x8 inches. Weight, 5 pounds. **Each** $1.00

394M4 Trays, Parting Cup, Small. Made of tinned sheet iron with twelve 1-inch holes. Dimensions, 5¾x8 inches. Will hold No. 113M1 porcelain crucibles Nos. 0 and 00. **Each** $1.00

394M5 Trays, Parting Cup, Large. Made of tinned sheet iron with twelve 1½-inch holes. Dimensions: 6½x9 inches. Will hold No. 113M1 porcelain crucibles Nos. 1 and 1A. **Each** $1.00



394M6



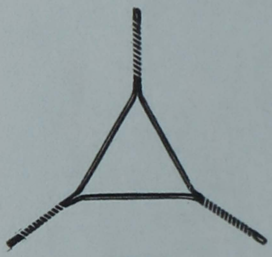
394M8

394M6 Trays, Button. Steel plate, 5½x2¼x¼ inches with 24 depressions of ⅜-inch diameter and ⅛-inch depth; milled smooth, neatly finished, for use inside of balance case. **Each** $1.00

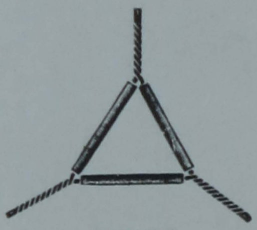
394M7 Trays, Button. Light-weight composition tray, 5x3¼x¼ inches, with 24 depressions ⅜-inch in diameter and ⅛-inch in depth, numbered 1 to 24. For use inside of balance case. **Each** $1.50

394M8 Trays, Coors Porcelain. Sides slightly flared, bottom flat. Glazed with exception of outside bottom.

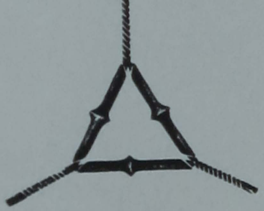
Size	**00**	**0**	**0A**	**1**	**1A**	**1B**	**1C**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**9A**	**10**
Height, mm.	8	10	10	32	12	20	15	36	40	54	76	56	38	57	76	40	40
Width, mm.	38	38	45	50	50	50	58	93	204	204	204	212	232	228	228	242	152
Length, mm.	50	50	68	77	77	77	91	225	204	204	204	212	237	228	228	295	610
Each	**$ .44**	**.44**	**.50**	**.55**	**.55**	**.55**	**.77**	**2.20**	**3.60**	**4.00**	**4.70**	**3.60**	**4.60**	**5.40**	**6.35**	**8.70**	**14.25**



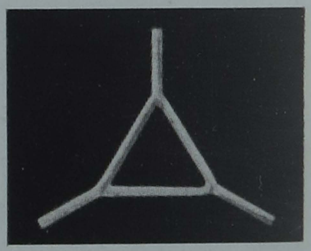
394M9



394M10



394M12



394M13

394M9 Triangles, Chromel (Nichrome). Of square wire. Resists corrosion and does not contaminate platinum ware.

Length, side, inches	1½	2	2½	3
Each	**$ .24**	**.24**	**.30**	**.30**

394M10 Triangles, Plain Clay Pipe Stem. Heavy galvanized iron wire covered with refractory clay pipe stems.

Length, side, inches	2	2½	3
Each	**$ .08**	**.08**	**.08**
Dozen	**$ .80**	**.80**	**.80**

394M11 Triangles, Plain Silica Pipe Stem. Similar to 394M10, except with satin-surface silica tubing on chromel wire.

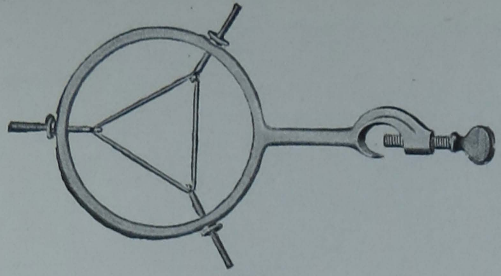
Length, side, inches	1½	2	2½	3
Each	**$ .40**	**.40**	**.55**	**.65**

394M12 Triangles, Flanged Clay Pipe Stem. Same as 394M10, except with flanged pipe stems which afford a 3 point support with minimum obstruction to the flame.

Length, side, inches	2	2½	3
Each	**$ .12**	**.12**	**.12**
Dozen	**$1.20**	**1.20**	**1.20**

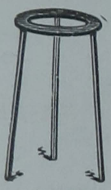
394M13 Triangles, Fused Silica. Made entirely of satin-surface fused silica. Recommended for use with platinum ware.

Length, side, inches	1½	2	2½	3
Each	**$1.50**	**1.50**	**1.75**	**2.00**

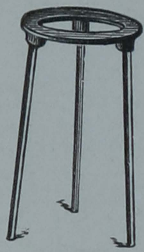


395M1

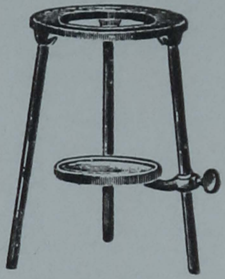
395M1 Triangle Holders for Platinum Triangles. Ring is cast iron, black japanned, with muff for rods up to ½ inch. Forged brass thumb screw and nickel-plated screw hooks. Inside diameter, 3¾ inches. Will accommodate any size triangle for holding crucibles up to 100 ml. **Each**......**$1.25**



395M2



395M3

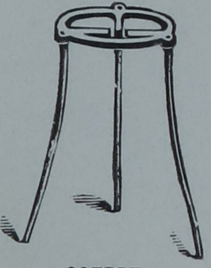


395M4

395M2 Tripods. Japanned iron, 6 inches high; inside diameter of ring, 2½ inches; outside diameter, 3⅝ inches. **Each**..**$ .30**

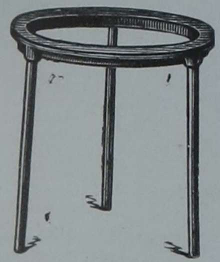
395M3 Tripods. Japanned iron ring and coppered iron legs, 9 inches high; inside diameter of ring, 3 inches; outside diameter, 4½ inches. **Each**..........................**$ .40**

395M4 Tripods. Same as 395M3, except with adjustable lamp bracket. **Each**..............................**$ .75**

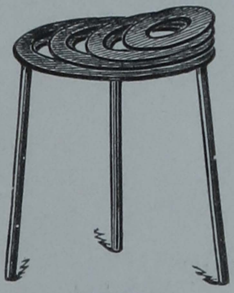


395M5

395M5 Tripods. With supporting lugs. Japanned iron, 9 inches high; inside diameter of ring, 3½ inches; outside diameter, 4¼ inches. **Each**..............................**$ .50**



395M6



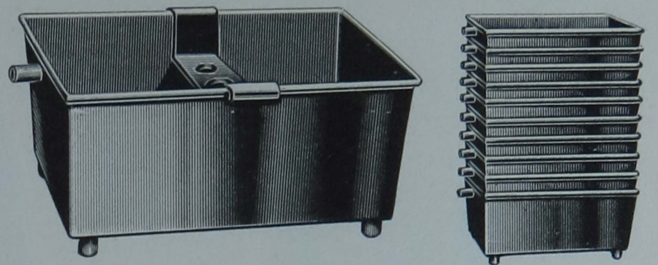
395M7

395M6 Tripods. Japanned iron ring and coppered iron legs. Height, 9 inches.

Diam., inside, inches	**3**	**4½**	**6**	**8**	**10**
Diam., outside, inches..	5	6	8	10	12
Each..................	**$ .40**	**.50**	**.75**	**1.00**	**1.25**

395M7 Tripods. Same as 395M6, except with inside iron rings.

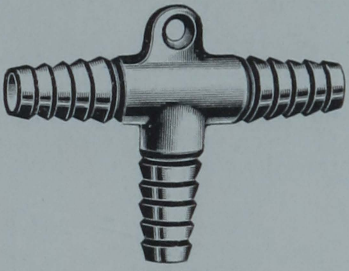
Diameter, outside, largest ring........	**5**	**6**	**8**	**10**	**12**
Number of extra rings..	1	2	3	4	5
Each..................	**$ .65**	**1.00**	**1.40**	**1.80**	**2.75**



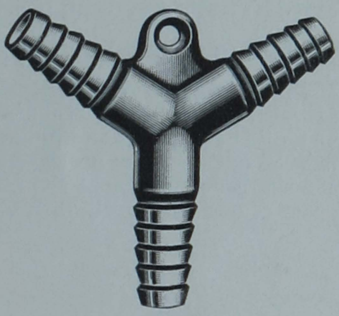
395M8

395M8 Troughs, Pneumatic. Of galvanized iron, with tapered sides for nesting. Fitted with rounded feet, overflow and sliding shelf.

Length, inches....................	**10**	**12**
Width, inches..........................	7	9
Depth, inches..........................	4	5
Each..................................	**$1.15**	**1.25**



395M9



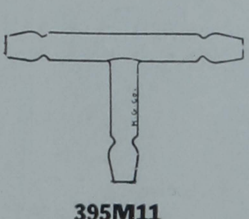
395M10

395M9 Tubes, Connecting, T-Shaped. Made of special corrosion resistant alloy composition. One-piece; tapered; serrated. Length of arms, 1⅜ inches.

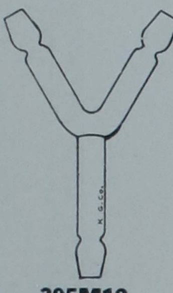
Diameter, bore, inches......................	3/16	5/16
Each......................................	**$ .40**	**.40**

395M10 Tubes, Connecting, Y-Shaped. Otherwise same as 395M9.

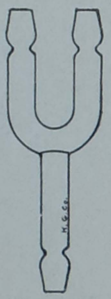
Diameter, bore, inches......................	3/16	5/16
Each......................................	**$ .40**	**.40**



395M11



395M12



395M13

395M11 Tubes, Connecting, T-Shaped. Of well-annealed glass. With polished oval ends for rubber tubing connections.

Diam., inches......	⅛	3/16	¼	⅜	½	¾
Length of arms, mm..	38	44	44	60	70	95
Each..............	**$ .11**	**.11**	**.11**	**.13**	**.16**	**.35**

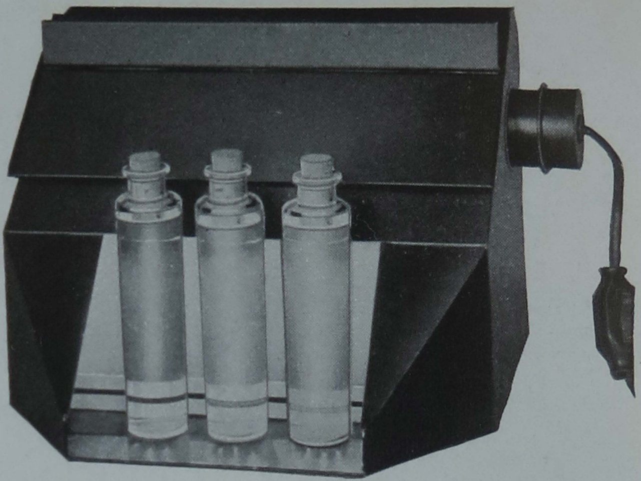
395M12 Tubes, Connecting, Y-Shaped. Of well-annealed glass. With polished oval ends for rubber tubing connections.

Diam., inches......	⅛	3/16	¼	⅜	½	¾
Length of arms, mm..	38	44	44	60	70	95
Each..............	**$ .13**	**.13**	**.13**	**.15**	**.18**	**.40**

395M13 Tubes, Connecting, U-Shaped. Of well-annealed glass. With polished oval ends for rubber tubing connections.

Diam., inches......	⅛	3/16	¼	⅜	½	¾
Length of arms, mm..	38	44	44	60	70	95
Each..............	**$ .13**	**.13**	**.13**	**.15**	**.18**	**.40**

396M1

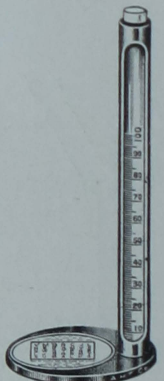


396M3

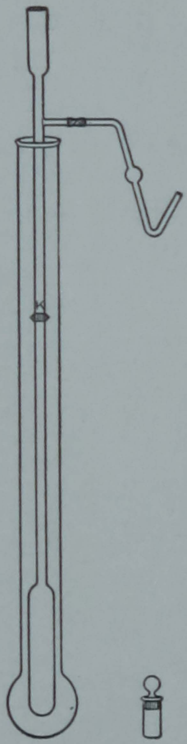
396M1 Tumblers. With pour-out. Heavy pressed glass. Capacity, 8 ounces. **Each**.................................$ .15

396M2 Tumblers. With out pour-out. Heavy pressed glass. Capacity, 8 ounces. **Each**...............................$ .15

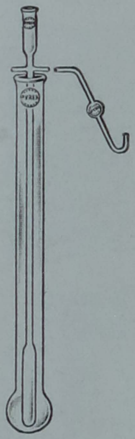
396M3 Turbidimeters, Clark. For observing the degree of clarity of liquid products and for estimating traces of suspended matter. Particularly useful for observing the turbidity of solutions in sugar refineries. Depends on visual, side-by-side comparison of liquids under strong illumination at the proper angle against a black, practically invisible background. Any particles of suspended matter show up clearly by reflecting light upward to the observer's eye. (nephelometric effect), also by interfering with the sharp delineation of the black line on white strip when viewed through the sample (turbidimetric effect). Differences on the order of one part per million can usually be detected. Shipping weight, 18 pounds. **Each**...........................$18.25



396M4



396M5



396M6

396M4 Turbidimeters, Kopke. For determination of clarity of sugar solutions in both factory and refinery practice. The depth of the solution, through which the standardized alphabetical test card can be read is measured in millimeters by an armored depth scale tube so that the maximum reading depth equals "Kopke clarity." **Each**..............................$7.50

396M5 Vapor Density Apparatus, Victor Meyer, Glass. Complete with outer jacket, inner tube and connecting tube, and small glass stoppered vial. **Each**..$2.20

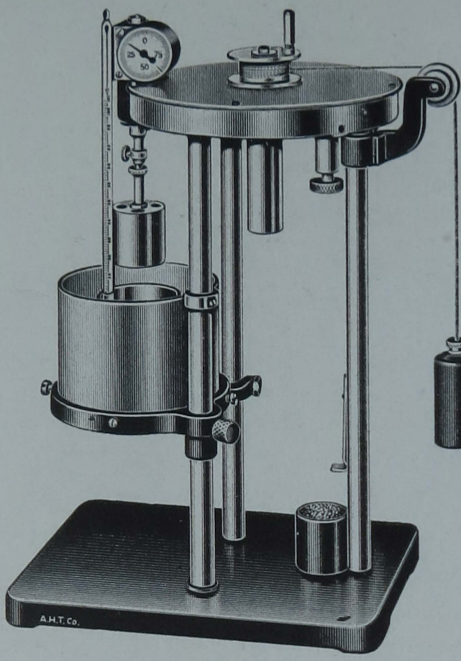
396M6 Vapor Density Apparatus, Victor Meyer, Pyrex. Consists of outer jacket, with bulb at lower end; inner tube; connecting tube with center bulb. Outside diameter: of outer jacket, 45 mm.; bulb, 65 mm.; connecting tubing, 7 mm.; center bulb of connecting tube, 25 mm. Total length of jacket, 630 mm.; of inner tube, 760 mm. **Complete**.......................$3.00

396M7 Outer Jacket, Only. For 396M6. **Each**..$1.40

396M8 Inner Tube, Only. For 396M6. **Each**..$1.30

396M9 Connecting Tube, Only. For 396M6. **Each**..$ .30

Viscosimeters



397M1

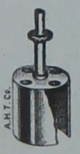
Viscosimeters, Stormer. For determining viscosities by measurement of the time required for a definite number of revolutions of the rotor immersed in the sample placed in the test cup, maintained at a desired temperature by means of a water or oil bath, and driven by a definite weight. A revolution counter is attached to the spindle of the rotor.

397M1 Viscosimeters, Stormer, A. S. T. M. D-115-T. For testing insulating varnishes and for general use. Supplied with cylindrical rotor 397M5, weight box 397M9, oil bath 397M19, and test cup 397M16. Complete in case with thermometer and directions for use. **Each**..............**$110.00**

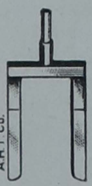
397M2 Viscosimeters, Stormer. Same as 397M1, except with a metal plate on movable shelf to hold container, and a fork-type rotor, 397M7, without oil bath or test cup. **Complete**..**$98.75**

397M3 Viscosimeters, Stormer, Variable Weight Outfits. For use with materials requiring adjustment of weight to produce a predetermined rate of shear. Same as 397M1, except provided with aluminum weight carrier, 397M10. **Complete**..**$110.00**

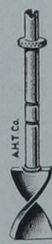
397M4 Viscosimeters, Stormer Variable Weight Outfits. For materials of high viscosity requiring heavier weights. Same as 397M1, except supplied with a set of slotted weights 397M11, one kilo. to 50 grams and hanger 397M12. **Complete**..**$123.75**



397M5



397M7



397M8

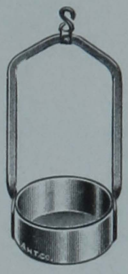
397M5 Cylindrical Rotors. Each..................**$6.50**

397M6 Cylindrical Rotors. Same as 397M5, except gold plated throughout for determining viscosities of acid materials. **Each**..**$14.00**

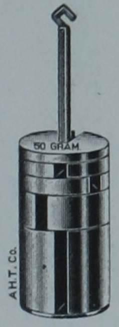
397M7 Fork-Type Rotors. Each **$6.00**

397M8 Propeller-Type Rotors. For measurements of oils, fluid greases and other heavy body materials. **Each**..**$13.75**

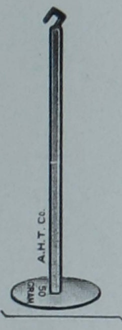
397M9



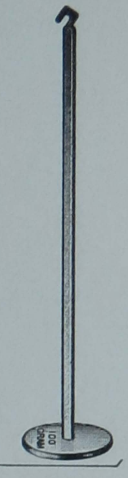
397M10



397M11



397M12



397M13

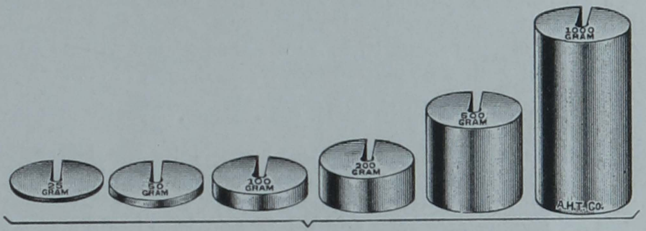
397M9 Weight Boxes. Each..........................**$1.50**

397M10 Weight Carriers. Made of aluminum for use with standard analytical balance weights. **Each**............**$1.50**

397M11 Slotted Weight Sets. Made up of one hanger, 397M12 or 397M13 and weights, 397M14 as selected.

397M12 Hangers, Only. As supplied with 397M4. 6 inches long; weight including bottom disc, 50 grams. **Each**...**$2.75**

397M13 Hangers, Only. Same as 397M12, except 9 inches long. Weight, 100 grams. **Each** **$3.60**

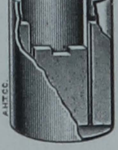


397M14

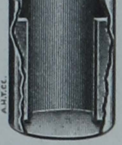
397M14 Slotted Weights, Only.

Size, grams	25	50	100	200	500	1000
Each	**$1.75**	**2.00**	**2.25**	**2.50**	**3.50**	**4.75**

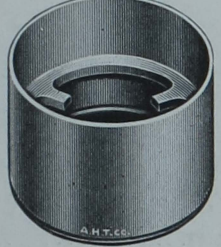
397M15 Thermometers. Range 0 to 105° C. in 1° graduations. With stem to fit test cup. **Each**..............**$1.80**



397M16



397M18



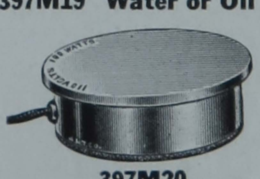
397M19

397M16 Test Cups. With two side vanes, central baffle and thermometer holder. For general work; as supplied with 397M1, 397M3 and 397M4 outfits. **Each**............**$5.00**

397M17 Test Cups. Same as 397M16, except gold plated on inside for use with acid materials. **Each**..........**$12.50**

397M18 Test Cups. Without central baffle or thermometer holder, for silicate and other liquids of high viscosity. **Each**..**$5.00**

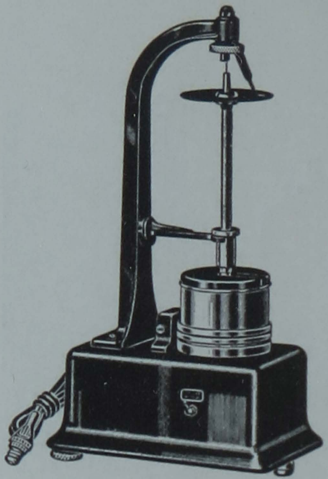
397M19 Water or Oil Baths. Each...............**$6.40**



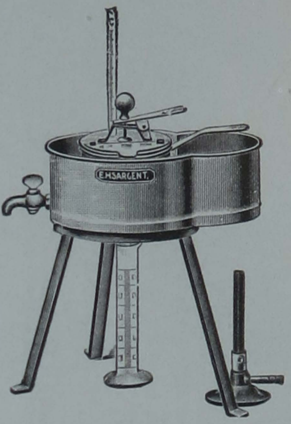
397M20

397M20 Electric Heaters. With adjustable thermostat, wound for 100 watts. With cord and plug for attachment to lamp socket. For 110 volts A. C. or D. C. **Each**..**$24.00**

Viscosimeters, Continued



398M1



398M3

398M1 Viscosimeters, MacMichael, Improved. Has a wide range and is adaptable for viscosities on oils ranging from the lightest distillate to the heaviest residuum. For testing and controlling the manufacture of highly viscous or plastic materials which cannot be tested on an orifice type viscosimeter. Operates on the torsion principle.

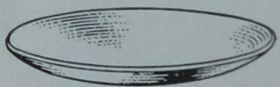
Viscosity of material is measured by the angle which is made by rotating a bob or plunger, suspended in liquid by a wire, while the container is turned at a definite speed. By choice of wire and speed a range of viscosities from 60 to 260,000 poises absolute is obtainable. Two speeds on the rotating cup are attained by a simple gear shift. The temperature in the bath is regulated by a heating element controlled by a convenient snap switch.

The viscosimeter is supplied with a disc plunger and a large cup for materials of low viscosity and a cylindrical plunger or bob with a smaller cup for heavy liquids. Four wires (No. 22, 26, 30, and 34 B. & S. gauge) are supplied as standard equipment, but any four as selected from 18 to 34 B. & S. gauge will be supplied. Complete with four wires, two plungers and two cups. When ordering specify current characteristics. **Each**............ **$195.00**

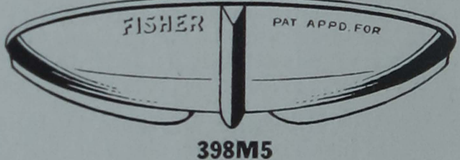
398M2 Wires. From 18 to 34 B. & S. gauge. Specify gauge desired. **Each, $2.00. Dozen**............ **$ 18.90**

398M3 Viscosimeters, Scott. Used especially for determining the viscosity of fluids such as heavy oils, varnishes or glue solutions. Utilizes a water bath with a non-removable inside oil cup container into which the oil cup is inserted so that the orifice, 10 mm. in length, protrudes through both the container and bottom of the bath. The oil cup is equipped with a hinged cover having a thermometer well and a lever-operated plunger, which is formed into a sharp cone at its lower end to throttle the viscosity orifice. Bath and cup are made of copper and the drain cock, plunger mechanism, and orifice are made of brass. Complete with thermometer, range, -10° to 220° F. in single degrees; 50 ml. cylinder; iron tripod; adjustable burner and instructions. **Each**............ **$25.00**

Watch Glasses



398M4



398M5

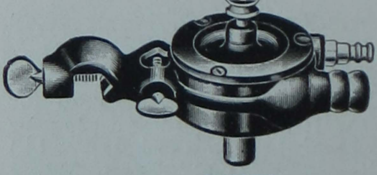
398M4 Watch Glasses. For covering beakers or various other laboratory vessels. Concave shape. Well-annealed clear glass.

Diameter, inches	**1**	**1½**	**2**	**2½**	**3**	**3½**	**4**	**4½**	**5**	**6**	**7**	**8**
For beakers, capacity, ml.	10	20	30	100	150	250	400	600	800	1000	1500	4000
Dozen	**$ .40**	**.45**	**.55**	**.60**	**.70**	**.85**	**.95**	**1.30**	**1.50**	**1.75**	**2.50**	**3.25**

398M5 Watch Glasses, Beaker Covers, "Speedy Vap." Permits a speed of evaporation approaching that from an open vessel. Gives protection against contamination, loss from splattering, etc. The cover is supported by means of three molded radial ribs on the bottom which strengthen the cover and reduce breakage due to mechanical shock.

Diameter, inches	**3**	**3½**	**4**	**4½**	**5**	**6**
For beakers, capacity, ml.	150	250	400	600	800	1000-1500
Dozen	**$1.10**	**1.25**	**1.40**	**1.55**	**1.70**	**2.25**

Water Motors

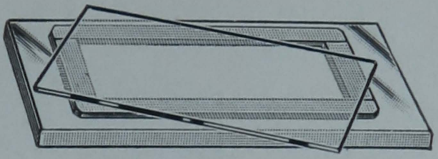


398M6

398M6 Water Motors. For driving light duty stirrers, etc.; suitable for operation on water, steam or compressed air. The one-piece brass rotor with stainless steel shaft attains a speed of approximately 2500 R. P. M. at a feed pressure of 20 pounds; or 4200 R. P. M. at 60 pounds. The brass pulley is grooved to take round belting up to 3/16-inch diameter.

Serrated nipples are provided for hose connections: inlet, for tubing 5/16- to ½-inch inside diameter; outlet; for ¾-inch inside diameter. Iron case is heavily japanned, with double clamp for fastening horizontally or vertically to rods up to 5/8-inch in diameter. **Each**.. **$8.50**

Water Testing Apparatus



399M1

399M1 Counting Cells, Sedgewick-Rafter, for Plankton. All-glass. Consists of heavy glass plate, 3x1½ inches, with acid-proof, cemented, rectangular glass frame. Capacity of cell, one ml.; depth, one mm. Without cover glass. **Each**.......... $5.50

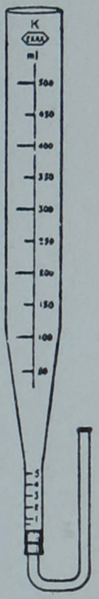
399M2 Cover Glasses. For 399M1. 35x60 mm. **Each, $ .20. Set** of three.......... $ .50

399M3 Filter Funnels, Exax Blue Line, Sedgewick-Rafter. For the collection of bacterial organisms in water by filtration through sand. Graduated 50 to 500 ml. in 25 ml.; the lower end constricted and graduated to 5 ml. in one ml. Complete with delivery tube and rubber stopper. **Each**.......... $2.50

399M4 Filter Discs. For use with 399M3. Made of bolting cloth. **Dozen**.......... $ .15

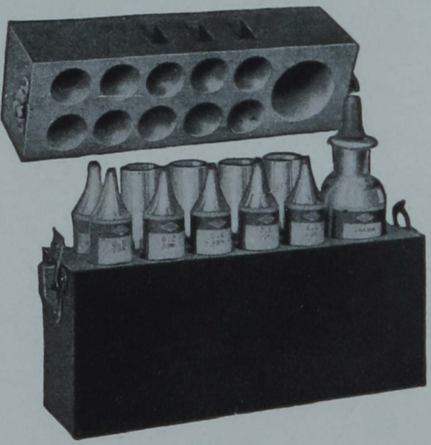
399M5 Filter Sand, Berkshire. Pound.......... $ .18

For Micrometer Discs, see page 260.
Pipettes, see page 316.
B. O. D. Bottles, see page 40.

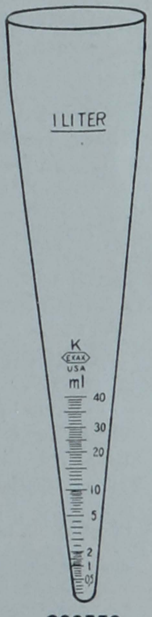


399M3

399M6



399M7



399M9

399M6 Comparators, Combination, La Motte. For controlling the alkalinity and residual chlorine in swimming pool water. Consists of a block comparator, chlorine and phenol red color standards to cover the proper zones for chlorine and alkalinity, and a supply of the reagents. **Complete**.......... $13.00

399M7 Comparators, Chlorine, Enslow, La Motte. For determining residual chlorine in treated water, sewage and industrial wastes. Eliminates the effects of color and turbidity, and also the error due to the presence of manganese, iron, nitrites, or other similar interfering substances.

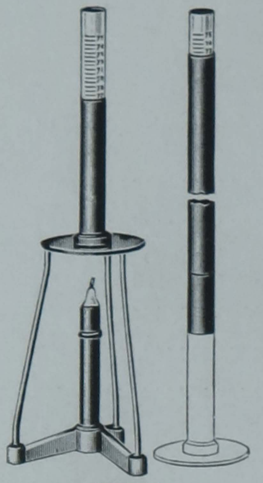
Consists of six chlorine color standards with values of 0.1, 0.2, 0.3, 0.5, 0.8 and 1.0 part per million of chlorine, made up in sealed glass ampoules; three 15 ml. test tubes; an ampoule of distilled water, and 50-ml. bottle of ortho tolidine reagent. The latter is fitted with a calibrated 0.5 ml. pipette. Complete in a polished wooden case, the top of which serves as a comparator for color readings. With full instructions. **Each**.......... $12.50

399M8 Ortho Tolidine Reagent.

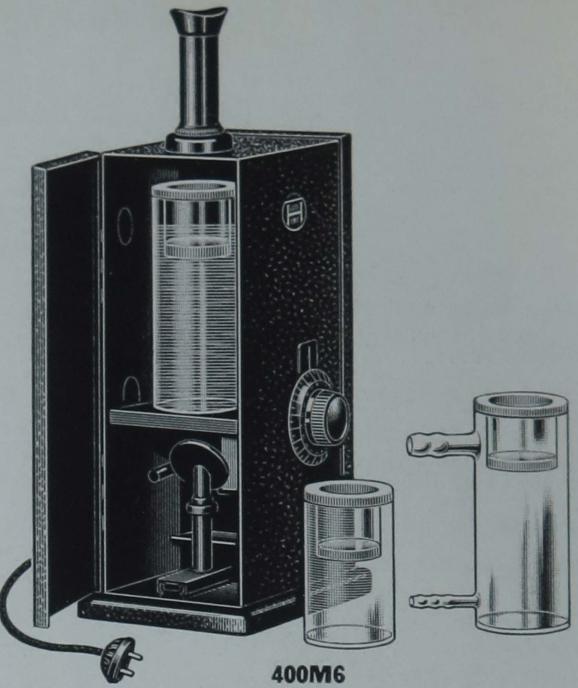
Quantity, ml..........	50	100	500	1000
Each..........	$ .75	1.00	2.50	3.75

399M9 Imhoff Cones, Exax Blue Line. Capacity, one liter. Graduated from 0 to 40 ml. in special divisions, and at the one-liter point. **Each**.......... $4.00

Water Testing Apparatus, Continued



400M1



400M6

400M1 Water Turbidimeters, Jackson. For measuring the turbidity of water in parts per million, SiO_2 standard. Graduated glass cylinder for containing the sample is retained in a metal tube above the flame of a standard candle, while a spring below the candle presses it upward and holds the flame at a fixed distance below the graduated cylinder. All metal parts are brass; metal tubes are oxidized black inside to prevent light reflection; the bottom of the glass cylinder is carefully polished. Complete with 25 cm. graduated cylinder and standard candle. **Each**.......... **$18.50**

400M2 Graduated Cylinder, Capacity, 25 ml. Each.......... **$2.00**

400M3 Graduated Cylinder, Capacity, 75 ml. Each.......... **$4.50**

400M4 Extension Tube. For use with 400M3. **Each**.......... **$4.00**

400M5 Standard Candles. Dozen.......... **$3.00**

400M6 Water Turbidimeters, Hellige. For measuring the turbidity of water from 0 to 150 parts per million. Consists of a metal housing finished in crystal black; size, 7x5x16 inches. Mounted in the housing is an opal glass bulb, a large reflector and precision slit which is operated by a drum knob. Tubes have fused-on plano-parallel bottom plates of optical glass and a short glass plunger with plano-parallel bottom plate automatically adjusts the proper liquid depth. The same plunger can be used with any of the three sizes of tubes.

Complete with one tube as selected.

Liquid depth of tube, mm.	**20**	**50**	**100**
Turbidity range of measurement, p. p. m.	0 to 150	0 to 50	0 to 15
Each	**$80.00**	**80.00**	**80.00**

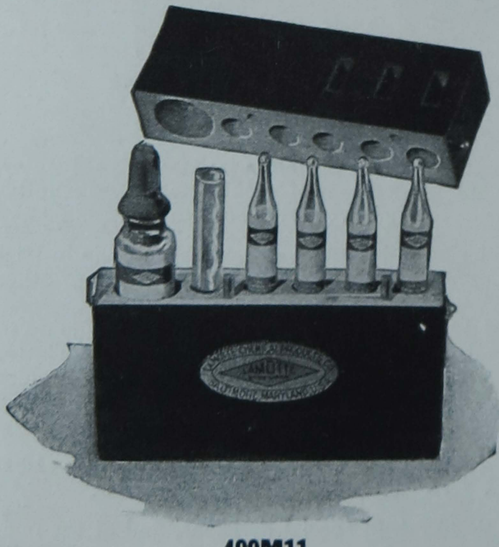
400M7 Tubes, Only. For use with 400M6.

Liquid depth, mm.	20	50	100
Each	**$6.50**	**6.50**	**6.50**

400M8 Water Turbidimeters, Hellige. Same as 400M6, except with tube of 100 mm. liquid depth for turbidity measurements from 0 to 15 p. p. m. With side arms for connecting water lines for continuous measurement. **Each**.......... **$87.50**

400M9 Tubes, Only. For use with 400M8. With side-arms for connecting to the water line. **Each**.......... **$14.00**

400M10 Plunger, Only. For use with tubes, 400M7 and 400M9. **Each**.......... **$13.00**



400M11

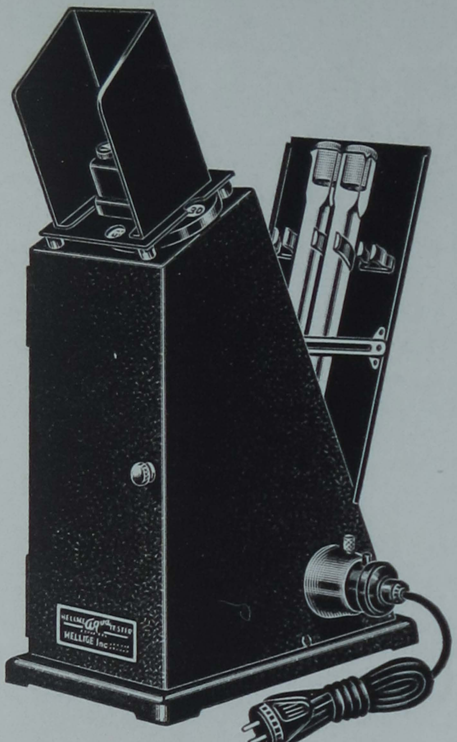
400M11 Water Sterilization Test Sets, La Motte. For determining the free or available chlorine in solutions used to sterilize bottles and containers. Set consists of four chlorine color standards, with the values of 20, 30, 50 and 100 parts of chlorine per million, made up in sealed glass ampoules; one 5 ml. test tube for making the tests; and a 20 ml. vial of ortho tolidine reagent. Complete in polished wooden pocket size case. Top of case contains three slots through which comparisons can be made with the standards. **Each**.......... **$6.00**

400M12 Ortho Tolidine Reagent. In 20 ml. vials for 400M11. **Each**.. **$ .50**

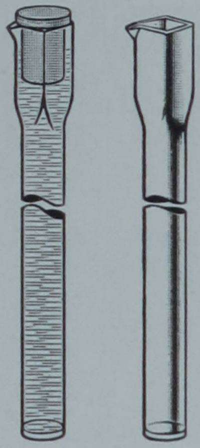
400M13 Color Standards.

Value, parts of chlorine per million	20	30	50	100
Each	**$ .60**	**.60**	**.60**	**.60**

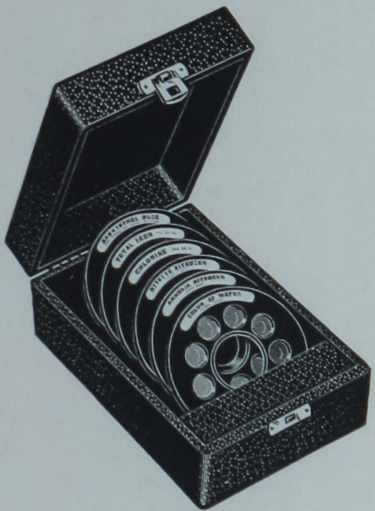
Water Testing Apparatus, Continued



401M1



401M2



401M5

401M1 Water Test Comparators, Hellige. Consists of a metal housing, supported by a heavy iron base. Mounted to the upper part is a platform which serves as a cover for the color disc and also carries a prism housing and light shield. The platform is attached by means of prongs which insure perfect alignment of the observation fields with the specimen tubes. The prism housing contains a dust-proof enclosed prism which brings the colors together into one enlarged field. The edges of the prism are ground and polished and no dividing line is visible when properly viewed. The inclined construction enables the observation of the color fields from a sitting position, and a light shield protects the observer from interfering light and facilitates accurate color comparison.

The lamp socket fits into a collar on the right side of the housing and is horizontally adjustable to compensate for irregular lamp bulb filaments. A removable opal glass plate and polished Corning filter glass plate provide proper diffusion of light and the worker is independent of daylight conditions.

The Nessler tubes are held by spring clips and automatically adjust themselves to the optical axis of the apparatus. The tubes are provided with fused-on plano-parallel bottom plates and automatic accurate adjustment of the proper liquid height is secured by the aid of a short, solid glass plunger with plane surfaces.

Complete with two 200 mm. Nessler tubes, two plungers, bulb for 110 volts, cord and plug, color disc case, and one color disc. When ordering specify desired color disc from listing below. **Each** **$65.00**

Note: Color discs and equipment for pH measurements, for use with the above apparatus, are shown on page 216.

401M2 Nessler Tubes, 200 mm., Only. With fused-on plane bottom plate. **Each** **$2.50**

401M3 Plungers, Only. Of polished optical glass. **Each** **$2.50**

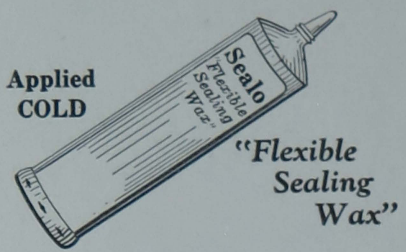
401M4 Pipettes, Only. With graduation at 0.298 ml., for measuring indicator solution. **Each** **$1.00**

401M5 Case, Only. For color discs. Can be stored in the apparatus housing and accommodates six color discs. **Each** **$3.00**

Hellige Color Discs for the Analysis of Water, Sewage and Industrial Wastes

For methods published by the American Public Health Association and American Water Works Association.

401M6 Color of Water I	0 5 10 15 20 25 30 35 40 color units	**$17.50**
401M7 Color of Water II	40 50 60 70 80 90 100 125 150 color units	**$17.50**
401M8 Ammonia Nitrogen I	0.00 0.02 0.06 0.1 0.14 0.20 0.28 0.34 0.40 parts per million	**$17.50**
401M9 Ammonia Nitrogen II	0.5 0.6 0.7 0.8 0.9 1.0 1.2 1.4 1.6 parts per million	**$17.50**
401M10 Nitrite Nitrogen	0.0 0.001 0.002 0.004 0.007 0.01 0.014 0.017 0.02 0.025 parts per million	**$17.50**
401M11 Nitrate Nitrogen I	0.00 0.02 0.06 0.1 0.14 0.2 0.4 0.6 1.0 parts per million	**$17.50**
401M12 Nitrate Nitrogen II	1.5 2.0 3.0 4.0 6.0 8.0 10.0 parts per million	**$17.50**
401M13 Chlorine I	0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 parts per million	**$17.50**
401M14 Chlorine II	0.1 0.2 0.3 0.4 0.5 parts per million	**$12.50**
401M15 Total Iron	0.0 0.1 0.2 0.6 0.8 1.0 1.4 2.0 3.0 parts per million	**$17.50**
401M16 Dissolved Oxygen	6.5 7.0 7.5 8.0 8.5 9.0 10.0 10.5 11.0 parts per million	**$17.50**



402M1

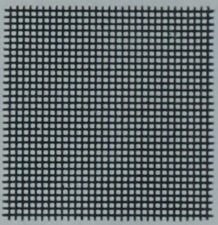
402M1 Wax, Sealing Cement, Sealo. A flexible di-electric sealing wax for making air-tight seals on any joint or surface. Only a thin film is necessary and is easily applied. Sets immediately, giving when dry a tough, impervious, insoluble, non-inflammable covering having a melting point above 200° C. **One-ounce Tube** .... **$ .30**

402M2 Wax, Red Sealing. Sticks. One-pound Box .... **$ .35**

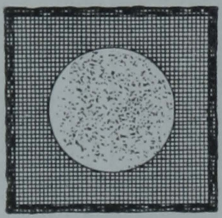
402M3 Wax, Sealing Cement, DeKhotinsky, Hard. For cementing glass, metal and porcelain. Not attacked by water, sulphuric acid, nitric acid, hydrochloric acid, bisulphide of carbon, benzene, gasoline or turpentine and is very little affected by ether, chloroform, caustic alkalies, etc. Soluble in alcohol. **One-ounce Package** .... **$ .75**

402M4 Wax, Sealing Cement, DeKhotinsky, Medium. Same as 402M3, except for cementing small or irregular pieces of metal to face plates of lathes or milling machines for precision work. **One-ounce package** .... **$ .75**

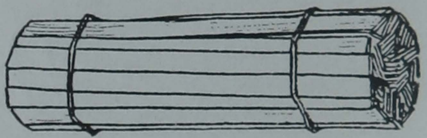
402M5 Wax, Sealing Cement, DeKhotinsky, Soft. Same as 402M3, except for insulating and covering electric wires, for condensers, static machines, protection against corrosion and for cementing soft rubber, hard rubber, wood, ivory, etc.
One-ounce package .... **$ .75**



402M6



402M9



402M15

402M6 Wire Gauze Squares, Iron. Heavy iron wire gauze. With plain edges.

Size, inches	4x4	5x5	6x6
Each	**$ .06**	**.07**	**.10**

402M7 Wire Gauze Squares, Special. Similar to 402M6, except of extra heavy iron wire. With plain edges.

Size, inches	4x4	5x5	6x6
Each	**$ .10**	**.12**	**.16**

402M8 Wire Gauze Squares, Chromel (Nichrome). Similar to 402M6, except made from corrosion-resistant chromel wire. With plain edges.

Size, inches	4x4	5x5	6x6
Each	**$ .35**	**.50**	**.70**

402M9 Wire Gauze Squares, Asbestos Center. Tinned iron wire gauze with asbestos disc in center. With folded edges.

Size, inches	4x4	5x5	6x6
Each	**$ .08**	**.10**	**.12**

402M10 Wire, Aluminum, Bare.

B. & S. gauge number	**14**	**18**	**20**	**24**
Feet per pound, approximate	268	667	1062	2685
100-foot coil	**$1.10**	**.75**	**.65**	**.60**

402M11 Wire, Chromel (Nichrome), Bare. 4-ounce coils.

B. & S. gauge number	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**32**
Feet per coil, approximate	52	85	135	215	350	550	860	1375
Coil	**$ .67**	**.72**	**.82**	**.95**	**1.08**	**1.24**	**1.32**	**1.50**

402M12 Wire, Copper, Bare, Soft.

B. & S. gauge number	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**
Feet per pound, approximate	129	204	325	518	820	1310	2070	3295
4-ounce spool	**$ .20**	**.22**	**.24**	**.26**	**.30**	**.30**	**.35**	**.40**
1-pound spool	**$ .70**	**.75**	**.75**	**.85**	**1.00**	**1.00**	**1.15**	**1.20**

402M13 Wire, Copper, Annunciator. Double cotton covered and paraffined.

B. & S. gauge number	**16**	**18**	**20**	**22**
Feet per pound, approximate	106	160	228	348
1-pound coil	**$ .55**	**.60**	**.75**	**.85**

402M14 Wire, Picture, Steel. Size No. 1. **Package** of 25 yards .... **$ .25**

For Wire Gauges, see page 204.

402M15 Wood Splints. Strips of thin wood. **Bundle** of 500 .... **$ .20**

403M1 Complete Fire Assaying Outfit. A list of the items furnished is shown below. As the furnace is equipped with direct-driven, high-speed, electric motor-blower, it can be furnished only for operation on 50 or 60-cycle current. If no current is available, or if available current is not of suitable cycle, furnace should be selected from others shown in the catalog, having belt-driven blower or air-pressure-reducing valves for operation on high pressure air. Estimated total shipping weight—domestic, 4800 pounds; export, 5300 pounds. Estimated total volume for export, 165 cubic feet. **Complete outfit as listed below** **$1167.00**

Note: For packing for ocean shipment add 5%.

Qty.	Cat. No.	Item
1	7M1	Heusser Group A, 1/500 mg. Sensitivity, Assay Button Balance
1 Set	19M1	Button Weights, No. 150, 1 gram to 1 mg., and 2 riders
1	10M2	Type M Ainsworth Pulp Balance. With agate edges
1 Set	18M6	Assay Ton Weights. 1 A. T. to 1/20 A. T.
2	18M3	Balance Covers. For above Balances
1	175M4	Oil-Fired, Single Muffle LG, Assay Muffle Furnace. (Capacity, 24 twenty-gram crucibles). Complete with burner, motor-blower, oil tank, hood, stack, stand, and piping for oil and air.
6	46M11	Camel Hair Brushes, Medium
24	113M1	Porcelain Parting Cups, Size O
1	394M4	Parting Cup Tray
1	46M10	Button Brush
1	3M2	6-Inch Diameter Slag Anvil
1	39M46	Button Tray
1	210M7	12-Ounce Slagging Hammer
1	321M2	Button Pliers, Bent Nose
1 Yd.	337M2	Rubber Sheeting
1	351M3	8-Inch Spatula
1	351M5	4-Inch Spatula
1	168M10	7-Inch Slag Forceps
1	274M4	Leeds Mortar
1	394M3	Iron Cupel Tray
1	273M2	6-Hole Slag Mold
1	392M9	36-Inch Crucible Tongs
1	392M4	36-Inch Cupel Tongs
1	131M4	1¼x1½ Inch Iler Cupel Machine
1 Pr.	208M6	14-Inch Asbestos Mittens

Qty.	Cat. No.	Item
1	26M4	Counter Platform Scales with Tin Scoop (For Fluxes)

Sample Preparation Equipment

Qty.	Cat. No.	Item
1	123M1	Samson Crusher. (For belt drive—requires 1 H. P.)
1	124M1	No. 6½ F McCool Pulverizer. (For Belt drive, requires 1 H. P.)
1	341M8	8x10-Inch Jones Sampler, Complete
1	122M1	20x24-Inch Buckboard with Muller
1 Set	343M1	8-Inch Tin Frame Testing Sieves. One each 10, 20, 30, 40, 60, 80, 150, and 200-mesh pan and cover
24	339M10	6-Inch Diameter Tinned Sample Pans
1	46M16	4-Inch Brush. (For Cleaning.)
500	340M4	4x7-Inch Sample Envelopes

Assaying Supplies

Qty.	Cat. No.	Item
500	117M7	(5 Cartons) 20-Gram Crucibles
50	342M3	3-Inch Regular Scorifiers
100 lbs.		Litharge, CP
50 lbs.		Borax Glass
10 lbs.		Test Lead, CP
100 lbs.		Sodium Carbonate Calcined
25 lbs.		Potassium Nitrate, Assay Grade
5 lbs.		Argols
10 lbs.		Powdered Silica
1 oz.		Silver Foil, CP
5 lbs.		(1 Roll) Lead Foil, Assay Grade
7 lbs.		(1 Bottle) Nitric Acid, CP
100 lbs.		XXX Bone Ash

403M2 Portable Fire Assay Outfit. The items contained in this outfit have been selected for field use. As no piece weighs more than 150 pounds the outfit can be transported by muleback. The furnace is gasoline fired and the sample preparation equipment designed for hand power. Estimated total shipping weight—domestic packing, 700 pounds; export packing, 800 pounds. Estimated total volume—export packing, 24 cubic feet. **Complete outfit as listed below** **$333.00**

Note: For carrying cases for muleback, nine required, add $60.00.
Note: For packing for ocean shipment, add 5%.

Qty.	Cat. No.	Item
1	9M1	Portable Balance Outfit. Consists of button balance and pulp balance, with weights. In carrying case, 12½x11½x6 inches.
1	182M5	Calkins Combination Assay Furnace. Capacity, 5 twenty-gram crucibles and twelve 1¼-inch cupels
1	59M3	Advance Gasoline Burner. For furnace.
1	60M9	5-Gallon Gasoline Tank and Piping. For burner.
6	46M11	Camel Hair Brushes, Medium
24	113M1	Porcelain Parting Cups, Size 0
1	394M4	Parting Cup Tray
2	46M10	Button Brushes
1	3M2	6-Inch Slag Anvil
1	394M6	Button Tray
1	394M3	Iron Cupel Tray
1	210M7	12-Ounce Slagging Hammer
1 pr.	321M2	Button Pliers, Bent Nose
1 yd.	337M2	Rubber Sheeting
1	351M3	8-Inch Spatula
1	351M5	4-Inch Spatula
1 pr.	168M10	6-Inch Slag Forceps
1	274M4	Leeds Mortar

Qty.	Cat. No.	Item
1	131M1	1¼-Inch Brass Cupel Mold
1	273M2	6-Hole Slag Mold
1 pr.	391M10	Crucible Tongs
1 pr.	392M4	Cupel Tongs, Special 18-inch length
1	276M1	Extra "C" Clay Muffle
1	122M1	12x18-Inch Buckboard with 25-lb. Muller
1	341M5	9x9-Inch Sampler with Scoop
1	122M5	Abbe Hand Lever Crusher, Jaw Opening, 2x3½-Inch

Assaying Supplies

Qty.	Cat. No.	Item
100	117M7	20-Gram Clay Crucibles
50 lbs.		XXX Bone Ash
2 lbs.		Lead Foil, Assay Grade
50 lbs.		Litharge, CP
1 oz.		Silver Foil, CP
50 lbs.		Sodium Carbonate, Calcined
10 lbs.		Borax Glass
10 lbs.		Potassium Nitrate
2 lbs.		Iron Nails, 20d
5 lbs.		Argols
5 lbs.		Powdered Silica
7 lbs.		(1 Bottle) Nitric Acid, CP

404M1 Chemical Laboratory for Mine. For determination in ores of antimony, arsenic, copper, iron, lead, silicates ("Insolubles"), sulphur, tin and zinc. **Complete outfit as listed below** **$510.00**

Qty.	Cat. No.	Item
2 lbs.	4M10	Asbestos Paper
1	14M1	Ainsworth Type DL Analytical Balance, 1/20 mg. Sensitivity
1 set	21M2	Analytical Weights, 100 Grams to 1 mg., and 2 Riders
12	33M1	Beakers, Pyrex, 150 ml.
24	33M1	Beakers, Pyrex, 250 ml.
12	33M1	Beakers, Pyrex, 400 ml.
6	33M1	Beakers, Pyrex, 600 ml.
2	33M1	Beakers, Pyrex, 1000 ml.
1	33M1	Beakers, Pyrex, 2000 ml.
4	44M15	Dropping Bottles, 30 ml.
2	45M10	Wash Bottles, Pyrex, 1000 ml.
1	40M4	½-Gallon Amber Bottle
1	47M12	Burette Brush
4	49M7	Burettes, Glass Stopcock, 50 ml.
2	52M5	Burettes, Dispensing, 500 ml.
1	58M6	Burner, Dangler Lamp
6	68M12	Casseroles, Size 3A
6	89M13	Mohr's Pinchcocks, 2¾-Inch
100	111M4	Assorted Corks, 10 each, sizes 6 to 15, incl.
1 Set	112M1	Cork Borers, Set No. 2
12	113M1	Crucibles, Porcelain, Size 0
1	319M7	Platinum Crucible and Cover, 20 ml.
2	133M1	Graduated Cylinders, 50 ml.
2	133M1	Graduated Cylinders, 100 ml.
1	133M1	Graduated Cylinders, 1000 ml.
1	152M4	Filter Cone, Nickel
500	156M4	Munktell Filter Papers, No. 0, 11 cm.
6	162M1	Flasks, Boiling, 500 ml.
6	163M1	Flasks, Erlenmeyer, 250 ml.
12	163M1	Flasks, Erlenmeyer, 500 ml.
12	170M3	Funnels, 75 mm. diameter, 60° angle.
1	198M4	Kipp Generator, 500 ml.
4 lb.	206M3	Glass Tubing, 6 mm.
1 lb.	206M1	Glass Rod, for Stirring, 6 mm.
1	213M2	Type 32, 18x24-Inch Hevi Duty Electric Hot Plate for 110 Volts or 220 Volts
1 box	231M6	Labels, Size 201
4	308M12	Pads, Wax Paper (Spot Pads)
12	314M1	Pipette Droppers
2	317M8	Plates, Porcelain, Size No. 1
2	314M5	Pipettes, Volumetric, 5 ml.
2	314M5	Pipettes, Volumetric, 10 ml.
2	314M5	Pipettes, Volumetric, 25 ml.
2	314M5	Pipettes, Volumetric, 50 ml.
12	336M11	Rubber Policemen
2 lbs.	337M5	Assorted Rubber Stoppers
50 ft.	338M2	Rubber Tubing, ¼x5/64-Inch
1	342M10	Shears, Trimming, 6-Inch
2	351M5	Spatulas, 5-Inch
1	356M1	Barnstead Still, Electric, 1-Gallon Capacity, 110 Volts
1	367M1	Support, Large Size
2	368M1	Support for Burettes
1	368M10	Support for Funnels
1	369M10	Test Tube Rack
1	378M6	Thermometer, 0 to 200° C.
2	391M11	Beaker Tongs

Qty.	Cat. No.	Item
2	391M16	Flask Tongs
12	372M2	Test Tubes, Pyrex, 150x18 mm.
12	398M4	Watch Glasses, 3-Inch
12	398M4	Watch Glasses, 3½-Inch
12	398M4	Watch Glasses, 4-Inch

Chemicals

Qty.	Item
1	1 lb. Bottle Acid Acetic CP Glacial
1	¼ lb. Bottle Acid Arsenious CP
1	6 lb. Bottle Acid Hydrochloric CP
1	1 lb. Bottle Acid Hydrofluoric CP
1	7 lb. Bottle Acid Nitric CP
1	9 lb. Bottle Acid Sulphuric CP
1	4 oz. Bottle Acid Tannic CP
1	¼ lb. Bottle Acid Tartaric CP
1	1 lb. Bottle Alcohol, Columbian Methanol
1	1 lb. Sheet Aluminum, 1/16-Inch
1	1 lb. Bottle Ammonium Chloride CP
1	4½ lb. Bottle Ammonia CP
1	1 lb. Bottle Ammonium Molybdate CP
1	1 lb. Bottle Ammonium Sulphide CP Dark
1	¼ lb. Bottle Antimony Metal CP Lump
1	¼ lb. Bottle Barium Chloride CP
1	¼ lb. Bottle Bromine CP
1	¼ lb. Sheet Copper Metal Electrolytic Sheet, .008 Inch Thick
1	1 lb. Bottle Cupric Sulphate CP Cryst.
1	¼ lb. Bottle Ferrous Ammonium Sulphate CP
5 lbs.	Ferrous Sulphide Tech.
1	¼ lb. Bottle Iodine CP
1	¼ lb. Spool Iron Wire No. 36. For standardizing
1 lb.	Test Lead, Metal, CP Gran.
1	¼ lb. Bottle Litmus Cubes
1	¼ lb. Bottle Mercuric Chloride CP
1	1 oz. Bottle Phenophthalein CP
1	1 oz. Bottle Methyl Orange
1	¼ lb. Bottle Potassium Chlorate CP
1	¼ lb. Bottle Potassium Dichromate CP
1	1 lb. Bottle Potassium Ferrocyanide CP
1	1 lb. Bottle Potassium Hydroxide CP Sticks
1	1 lb. Bottle Potassium Iodide CP Cryst.
1	¼ lb. Bottle Potassium Nitrate CP Cryst.
1	¼ lb. Bottle Potassium Permanganate CP
1	1 oz. Bottle Silver Nitrate CP
1	1 lb. Bottle Sodium Acetate CP
1	1 lb. Bottle Sodium Bicarbonate CP
1	1 lb. Bottle Sodium Carbonate CP Anhyd.
1	1 lb. Bottle Sodium Chloride CP Fine Cryst.
1	1 lb. Bottle Sodium Hydroxide CP Sticks
1	¼ lb. Bottle Sodium Peroxide CP
1	1 lb. Bottle Sodium Sulphate CP Anhyd.
1	1 lb. Bottle Sodium Thiosulphate CP
1	1 lb. Bottle Stannous Chloride CP Cryst.
1	1 lb. Bottle Starch Soluble CP Powd.
1	¼ lb. Bottle Tin CP Mossy
1	1 oz. Bottle Uranium Nitrate CP Cryst.
1	¼lb. Bottle Zinc Metal CP 20-Mesh

Estimated total shipping weight—domestic packing, 500 pounds; export packing, 600 pounds. Estimated total volume—export packing, 50 cubic feet.

Note: For ocean shipment packing, add 5%.

404M2 Chemical Laboratory for Mine. Same as 404M1, except electric still and electric hot plate are replaced by two-burner gasoline hot plate and Ralston Water Still. **Complete outfit** **$400.00**

International Atomic Weights

1938

	Symbol	Atomic Number	Atomic Weight
Aluminum	Al	13	26.97
Antimony	Sb	51	121.76
Argon	A	18	39.944
Arsenic	As	33	74.91
Barium	Ba	56	137.36
Beryllium	Be	4	9.02
Bismuth	Bi	83	209.00
Boron	B	5	10.82
Bromine	Br	35	79.916
Cadmium	Cd	48	112.41
Calcium	Ca	20	40.08
Carbon	C	6	12.010
Cerium	Ce	58	140.13
Cesium	Cs	55	132.91
Chlorine	Cl	17	35.457
Chromium	Cr	24	52.01
Cobalt	Co	27	58.94
Columbium	Cb	41	92.91
Copper	Cu	29	63.57
Dysprosium	Dy	66	162.46
Erbium	Er	68	167.2
Europium	Eu	63	152.0
Fluorine	F	9	19.00
Gadolinium	Gd	64	156.9
Gallium	Ga	31	69.72
Germanium	Ge	32	72.60
Gold	Au	79	197.2
Hafnium	Hf	72	178.6
Helium	He	2	4.003
Holmium	Ho	67	163.5
Hydrogen	H	1	1.0081
Indium	In	49	114.76
Iodine	I	53	126.92
Iridium	Ir	77	193.1
Iron	Fe	26	55.84
Krypton	Kr	36	83.7
Lanthanum	La	57	138.92
Lead	Pb	82	207.21
Lithium	Li	3	6.940
Lutecium	Lu	71	175.0
Magnesium	Mg	12	24.32
Manganese	Mn	25	54.93
Mercury	Hg	80	200.61
Molybdenum	Mo	42	95.95
Neodymium	Nd	60	144.27
Neon	Ne	10	20.183
Nickel	Ni	28	58.69
Nitrogen	N	7	14.008
Osmium	Os	76	190.2
Oxygen	O	8	16.0000
Palladium	Pd	46	106.7
Phosphorus	P	15	31.02
Platinum	Pt	78	195.23
Potassium	K	19	39.096
Praseodymium	Pr	59	140.92
Protactinium	Pa	91	231
Radium	Ra	88	226.05
Radon	Rn	86	222
Rhenium	Re	75	186.31
Rhodium	Rh	45	102.91
Rubidium	Rb	37	85.48
Ruthenium	Ru	44	101.7
Samarium	Sm	62	150.43
Scandium	Sc	21	45.10
Selenium	Se	34	78.96
Silicon	Si	14	28.06
Silver	Ag	47	107.880
Sodium	Na	11	22.997
Strontium	Sr	38	87.63
Sulfur	S	16	32.06
Tantalum	Ta	73	180.88
Tellurium	Te	52	127.61
Terbium	Tb	65	159.2
Thallium	Tl	81	204.39
Thorium	Th	90	232.12
Thulium	Tm	69	169.4
Tin	Sn	50	118.70
Titanium	Ti	22	47.90
Tungsten	W	74	183.92
Uranium	U	92	238.07
Vanadium	V	23	50.95
Xenon	Xe	54	131.3
Ytterbium	Yb	70	173.04
Yttrium	Y	39	88.92
Zinc	Zn	30	65.38
Zirconium	Zr	40	91.22

CHEMICAL SECTION

58% SODA ASH
ALKALI
58% SODA ASH
ALKALI
FROM MINE and SMELTER SUPPLY COMPANY DENVER, COLORADO
FROM MINE and SMELTER SUPPLY COMPANY Denver, Colorado MECHANICAL ELECTRICAL CHEMICAL
FROM The Mine & Smelter Supply Co. El Paso, Texas, U. S. A. MECHANICAL ELECTRICAL CHEMICAL
ALUM
ALUM

"Baker's Analyzed" (B. A.) **Mallinckrodt (Mall)**

J. T. Baker's (J. T. B.) **Coleman and Bell (C. & B.)**

Baker and Adamson (B. & A.) **Eastman (E. K.)**

Merck **Difco** **Pfanstiehl** **Paragon**

In the following list of Chemicals and Reagents we have listed those generally used in laboratory work and industry. This list does not contain all the chemicals which we can supply, and orders and inquiries for any items not shown will receive prompt attention.

The prices shown are base prices at time of publication of this catalog, and, as chemical prices fluctuate daily, should be used for estimating purposes only. All orders will be filled at current prices based on the market at the time the order is received. Manufacturers' price lists of organic and inorganic chemicals will be furnished upon request.

Containers charged extra are usually returnable, if in good condition, for credit, F. O. B. point of origin. Please secure shipping instructions before returning empty containers.

ABBREVIATIONS

Grade

C. P.	Chemically Pure
U. S. P.	U. S. Pharmacopoeia
Tech.	Technical
Com'l.	Commercial
A. C. S.	American Chemical Society
Spec.	Special
N. F.	National Formulary

Forms

Cryst.	Crystals
Anhyd.	Anhydrous
Powd.	Powdered
Prec.	Precipitated
Gran.	Granular
Sol.	Solution

Containers

b.	Cork Stoppered or Screw Cap Bottle
g. s. b.	Glass Stoppered Bottle
ctn.	Carton
can	Metal Can
demj.	Demijohn
cby.	Carboy
bbl.	Barrel

Quantities

lb.	Pound
oz.	Ounce
gm.	Gram
gr.	Grain
ml.	Milliliter

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	1 oz. Each	¼ lb. Each	1 lb. Each	5 lbs. Per lb.
Acetaldehyde C.P. $CH_3.CHO$ BP 20°-24° C M.W. 44.03	....	\$ .42	\$1.27	....
Acetamide, Purified, Cryst. $CH_3.CO.NH_2$ M.W. 59.06	\$ .20	.51	1.47	....
Acetanilid U.S.P., Cryst. or Powd. $C_6H_5NHCH_2.CO$ M.W. 135.12	.10	.19	.57	\$ .62
Acetic Anhydride C.P. ACS $(CH_3CO)_2O$ M.W. 102.07	....	.49	1.24	1.04
Acetic Anhydride, Tech., 90-95%	....	....	.72	.53
Acetone C.P. ACS $(CH_3)_2CO$ M.W. 58.06 25 lb. Demj., **\$ .30 lb.**	....	.23	.56	.51
Acetone U.S.P.	....	....	.39	.34
Acetone, Bulk (6.67 lb. per gal.) 1 gal., **\$1.50 gal.;** 5 gal., **\$1.25 gal.** 50 gal., **\$7.50 cwt.**				
Acetophenetidin U.S.P., Powd.	.18	.43	1.55	1.52
Acetophenone C.P. (Hypnone) $C_6H_5.CO.CH_3$ MP 17°-20° C M.W. 120.10	.35	.70	2.50	....
Acetyl Chloride C.P. CH_3COC1 M.W. 78.49	....	.77	1.95	....
Acid Acetic C.P., Glacial, 99.5% ACS CH_3COOH M.W. 60.04	....	.30	.60	.40
10x5 lb. GSB, **\$ .16 lb.***; 100 lb. carboy, **\$ .14 lb.****				
Acid Acetic C.P., Special, 99.6%-99.7% ACS Empyreuma Free (Bichromate Test ½ Hr.)	....	.35	.74	.55
Acid Acetic C.P., Special (For Shellac Analysis)	....	....	1.35	1.16
Acid Acetic U.S.P., Glacial, 99.5% (8.8 lb. per gal.)	....	....	.35	.30
10x5 lb., **\$ .12 lb.;*** 1 gal. jug, **\$2.50 gal.;**5 gal. jug, **\$2.25 gal.;** 100 lb. carboy, **\$12.09 cwt.****				
Acid Acetic, Purif., 80%	....	....	.36	.31
Acid Acetic C.P., 50%	....	....	.57	.36
Acid Acetic U.S.P., 36%	....	....	.34	.29
Acid Acetic, 56%, Com'l.	....	....	.35	.25
1 gal. jug, **\$1.50 gal.;** 5 gal. jug, **\$1.25 gal.;** 100 lb. carboy, **\$9.00 cwt.****; 52 gal. bbl. (410 lb.), **\$8.50 cwt.******				
Acid Acetic, 28%, Com'l., No. 8 (8 lb. per gal.)	....	....	.25	.15
1 gal., **\$ .95 gal.;** 5 gal., **\$ .85 gal.;** 100 lb. carboy, **\$6.00 cwt.****				
Acid Acetic and Iodine Monochloride (For Shellac analysis)—See Wijs Solution.				
Acid Acetylsalicylic U.S.P., (Aspirin) Gran. or Powd. $C_6H_4O.(CH_3CO).COOH$ M.W. 180.11	.13	.28	.92	.90
Acid Anthranilic C.P. (MP 143°-145° C) $C_6H_4NH_2.COOH$ (1:4) M.W. 137.10	.26	.51	1.80	....
Acid Arsenic Anhydride C.P., Powd. As_2O_5 M.W. 229.92	.30	.61	1.63	1.43
Acid Arsenic Anhydride, Tech., Powd	....	.29	.73	....
Acid Arsenious Anhydride C.P., Powd. As_2O_3 M.W. 197.92	....	.25	.61	.56
Acid Arsenious, Anhydride, C.P., Spec. Powd. ACS	.27	.82	2.51	....
Acid Arsenious, Anhydride, (Arsenic Trioxide), U.S.P., Powd.	.13	.18	.51	.47
Acid Arsenious (Arsenic Trioxide) Tech., 98-100%	....	....	.27	.23
Acid Benzoic C.P., Sublimed ACS C_6H_5COOH M.W. 122.08	.18	.49	1.40	1.35
Acid Benzoic U.S.P. (Synthetic)	.17	.31	.99	.92
Acid Boric (Acid Boracic) C.P., Cryst. ACS H_3BO_3 M.W. 61.92	....	.22	.49	.44
Acid Boric U.S.P., Cryst. or Powd.	....	.11	.25	.22
Acid Boric U.S.P., Powd or Cryst. Bulk H_3BO_3 M.W. 61.84	....	....	.18	.15
10 lb., **\$ .13 lb.;** 25 lbs., **\$ .11 lb.;** 50 lbs., **\$ .09 lb.;** 100 lb. bag, **\$ .07 lb.;** 330 lb. bbl., **\$7.50 cwt.;** 2000 lb. in bags, **\$6.75 cwt.;** 2000 lb. in bbls., **\$7.25 cwt.**				
Acid Boric U.S.P., Impalp. Powd.	....	....	.26	.23
Acid N-Butyric C.P. 98-100% $CH_3.CH_2.CH_2.COOH$ M.W. 88.08	.24	.36	.99	.94
Acid Calcium Phosphate (See Calcium Phosphate Primary).				
Acid Camphoric U.S.P., Powd $C_8H_{14}(COOH)_2$ M.W. 200.18	.57	1.94	7.48	7.40
Acid Caproic $CH_3(CH_2)_4COOH$ M.W. 116.13	.31	.85	3.08	....
Acid Carbolic (Phenol) C.P., Loose Cryst. C_6H_5OH M.W. 94.08	....	.26	.65	.60
Acid Carbolic (Phenol) U.S.P., Loose Cryst.	....	.23	.55	.49
Acid Carbolic (Phenol) U.S.P., Fused Cryst.	....	....	.47	.42
Acid Carbolic (Phenol) U.S.P., Liquid 88% (For disinfecting purposes, etc.)	....	....	.46	.42
Acid Chloroplatinic—See Platinum Chloride.				
Acid Chromic (Chromic Anhydride-Chromic Trioxide) C.P., Cryst. ACS CrO_3 M.W. 100.01	.35	.64	1.50	1.26
Acid Chromic U.S.P.	.29	.54	1.27	1.07
Acid Chromic, Tech., 99%, Low in SO_4	....	....	.85	.61
Acid Chromic, Bulk	....	....	.25	.23
10 lb., **\$ .21 lb.;** 25 lb., **\$ .20 lb.;** 50 lb., **\$ .19 lb.;** 100-lb. drum, **\$18.20 cwt.;** 400-lb. drum, **\$18.20 cwt.**				
Acid Cinnamic, Pure $C_6H_5.CH{:}CH.COOH$ M.W. 148.11	....	1.50	5.68	....
Acid Citric C.P., Cryst. ACS $H_3C_6H_5O_7.H_2O$ M.W. 210.11 25-lb. keg, **\$ .68 lb.**	.14	.35	.95	.90
Acid Citric C.P., Special Cryst. ACS (Low in Lead)	.15	.46	1.27	1.22
Acid Citric C.P., Powd.	....	.38	1.01	.96
Acid Citric U.S.P., Cryst. or Gran. 25-lb. keg, **\$ .30 lb.**	....	....	.44	.41
Acid Citric U.S.P., Powd.	....	....	.45	.42
Acid Cresylic 97% Pure, Bulk (8.58 lb. per gal.).				
1-gal. can, **\$1.95 gal.;** 5-gal. can, **\$1.65 gal.;** 10-gal. can, **\$1.45 gal.;** 50-gal. drum, **\$1.00 gal.**				
Acid Formic C.P., 90%, Liquid ACS $HCOOH$ M.W. 46.02	....	.40	.91	.72
Acid Formic, Tech., Sp. Gr. 1.20 (about 85%)	....	....	.62	.43
Acid Gallic C.P., Powd. $C_6H_2(OH)_3.COOH+H_2O$ M.W. 188.10	....	.51	1.47	....
Acid Gallic N.F.	.17	.36	1.24	1.21
Acid Glycerophosphoric, Pure, 25% $C_3H_5(OH)_2.O.P{:}O(OH)_2$ M.W. 172.13	.35	.73	2.30	2.08
Acid Hydriodic, Purified (Sp. Gr. 1.50) HI M.W. 127.93	....	1.01	3.46	....
Acid Hydrobromic C.P., 48% (Sp. Gr. 1.49) HBr M.W. 80.93	.34	.65	1.71	1.52

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*Case and bottles \$5.50 extra and returnable.

**Carboy \$5.00 extra and returnable.

***Case and bottles included.

****Container extra and returnable.

	1 oz. Each	¼ lb. Each	1 lb. Each	5 lbs. Per lb.
Acid Hydrobromic, Purified 34% (Sp. Gr. 1.30)	....	$ .46	$1.01	$ .82
Acid Hydrochloric C.P. ACS (Sp. Gr. 1.18-1.19) HCl M.W. 36.47 6-lb. gsb, **$ .25lb.;** 10x6 lb., **$ .22½** lb.***; 110-lb. carboy, **$ .12½ lb.****	....	....	.49	....
Acid Hydrochloric C.P., Special ACS (Arsenic Free Sp. Gr. 1.18-1.19) 6-lb. gsb, **$ .32 lb.**	....	....	.51	....
Acid Hydrochloric (Muriatic Acid), Com'l., 18° Be. 6-lb. bottle (5 pts.), **$ .79 ea.;** 1-gal. jug, **$ .85 gal.;** 5-gal. jug, **$ .80 gal.;** 112-lb. carboy, **$3.85 cwt.****	....	....	.30	....
Acid Hydrochloric (Muriatic Acid), Com'l., 22° Be. (9.5 lb. per gal.) 112-lb. carboy, **$4.10 cwt.****				
Acid Hydrochloric U.S.P. Same price as C.P.				
Acid Hydrofluoric C.P. ACS (about 48%) HF M.W. 20.01	$ .29	.51	1.30	....
Acid Hydrofluoric C.P., Special ACS HF M.W. 20.01	.30	.59	1.52	....
Acid Hydrofluoric, Tech., 48% and 52%	.25	.39	.82	....
Acid Hydrofluoric, Tech., 48%, 52% and 60% 5-lb. lead jug, **$ .30 lb.;** 10-lb. lead jug, **$ .29 lb.;** 20-lb. lead jug, **$ .27 lb.** (Lead jugs extra and returnable.)				
Acid Hydrofluoric, White, for Frosting—See Diamond Ink.				
Acid Hydrofluosilicic (Acid Hydrosilicofluoric) C.P. H_2SiF_6 M.W. 144.12	.29	.52	1.33	....
Acid Hydrofluosilicic, Tech.	....	....	.94	....
Acid Hypophosphorous, 50% $H_2PO.OH$ M.W. 66.06	....	.67	2.12	....
Acid Hypophosphorous U.S.P., 30-32%	....	.52	1.51	....
Acid Iodic C.P., Cryst. HIO_3 M.W. 175.93	.98	3.03	9.69	....
Acid Iodic (Anhydride), C.P. I_2O_5 M.W. 333.84	1.40	4.55	14.76	....
Acid Lactic C.P., Liquid $CH_3CH(OH).COOH$ M.W. 90.05	....	.44	1.26	1.21
Acid Lactic U.S.P., 85%, Liquid	.23	.30	.88	.83
Acid Maleic $COOH.HC:CH.COOH$ M.W. 116.05	.19	.31	.92	....
Acid Malic $COOH.CH_2.CH.OH.COOH$ M.W. 134.07	.21	.31	.92	.85
Acid Mandelic $C_6H_5CH(OH).COOH$ M.W. 152.10	.33	.86	3.12	2.99
Acid Molybdic C.P., 85%, Powd. ACS 25-lb. keg, **$1.23 lb.**	.20	.55	1.60	1.55
Acid Molybdic C.P. (Acid Molybdic Anhydride) (Ammonia free) Spec. Powd., ACS MoO_3 M.W. 144 25-lb. keg, **$2.36 lb.**	.33	.94	2.90	2.85
Acid Molybdic, Purified, 85%, Powd.	....	.40	1.34	1.29
Acid Monochloracetic C.P., Cryst. $CH_2Cl.COOH$ M.W. 94.49	.33	.53	1.34	1.12
Acid Monochloracetic, Purified, Cryst.	.26	.40	1.01	.82
Acid Muriatic—See Acid Hydrochloric.				
Acid Nitric C.P. ACS (Sp. Gr. 1.42) HNO_3 M.W. 63.02 7-lb. gsb, **$ .31 lb.;** 10x7-lb. case, **$ .27½ lb.*****; 135-lb. carboy, **$ .17½ lb.****	....	....	.65	....
Acid Nitric U.S.P. Same price as C.P.				
Acid Nitric C.P., Fuming (Sp. Gr. 1.49-1.50) 7-lb. gsb-can, **$ .49 lb.**	....	....	.85	....
Acid Nitric C.P., Red Fuming (Sp. Gr. 1.60) 7-lb. gsb-can, **$ .95 lb.**	....	....	1.30	....
Acid Nitric, Com'l., 38° Be. HNO_3 M.W. 63.02 (11.3 lbs. per gal.) 7-lb. bottle (5 pts.), **$ .18 lb.;** 1-gal. jug, **$1.80 gal.;** 5-gal. bottle, **$1.75 gal.;** 130-lb. carboy, **$9.50 cwt.**** (Note: For 42° Be in carboys, add $1.00 cwt.)	....	....	.35	....
Acid Nitric, Tech., Fuming (Sp. Gr. 1.49-1.50) 7-lb. gsb-can, **$ .35 lb.**	....	....	.68	....
Acid Nitric, Tech., Red Fuming (Sp. Gr. 1.59-1.60) 7-lb. gsb-can, **$ .69 lb.**	....	....	1.01	....
Acid Oleic U.S.P., Liquid	....	....	.44	.39
Acid Oleic, Bulk (7.6 lb. per gal.) 1-gal., **$1.45 gal.;** 5-gal. can, **$1.10 gal.;** 50-gal. drum, **$ .90 gal.**	....	....	.50	....
Acid Osmic—See Acid Perosmic.				
Acid Oxalic C.P., Cryst. $(COOH)_2 2H_2O$ M.W. 126.05 25-lb. keg, **$ .41 lb.**	....	.26	.65	.60
Acid Oxalic C.P., Special Cryst. ACS (For Standardizing) $(COOH)_2 2H_2O$ M.W. 126.05	....	.36	.91	....
Acid Oxalic C.P., Anhyd. Powd.	....	.53	1.56	....
Acid Oxalic, Tech., Bulk 1 to 24-lb. lots, **$ .25 lb.;** 25 lbs., **$ .20 lb.;** 50 lbs., **$ .18 lb.;** 100 lbs., **$ .16 lb.;** 300-lb. bbls., **$ .15 lb.**				
Acid Palmitic, Tech. $C_{15}H_{31}.COOH$ M.W. 256.34	.30	.35	1.10	....
Acid Perchloric C.P., 70-72% ACS $HClO_4$ M.W. 100.47	....	.47	1.13	.94
Acid Perchloric C.P., 60% Sol. ACS (Sp. Gr. 1.54)	....	.46	1.07	.87
Acid Perchloric C.P., 60% Sol. ACS (Sp. Gr. 1.54)	....	.46	1.07	.77
Acid Perchloric C.P., 20% ACS (Sp. Gr. 1.12)	.25	.39	.87	.64
Acid Perosmic (Acid Osmic) OcO_4 M.W. 254.90 ½-gram tube, **$3.05;** 1-gram tube, **$5.85.**				
Acid Phospho-Molybdic C.P., Cryst. $P_2O_5.20MoO_3.51H_2O$ M.W. 3940.90	.74	2.56	8.13	....
Acid Phospho-Molybdic C.P. (10% Test Sol.)	.33	.62	1.66	....
Acid Phosphoric C.P., 85% Sol. ACS (Ortho) (Sp. Gr. 1.71) H_3PO_4 M.W. 98.06 7-lb. acid-tite b., **$ .48 lb.;** 70-lb. carboy, **$ .24 lb.******	....	.34	.72	....
Acid Phosphoric C.P., 50% Sol. (Sp. Gr. 1.35)	....	....	.74	.56
Acid Phosphoric U.S.P., 85%, Syrupy. 7-lb. bottle, **$ .38 lb.**	....	.29	.61	.45
Acid Phosphoric Anhyd.—See Phosphoric Anhydride.				
Acid Phosphoric Meta C.P., Sticks	....	.62	1.86	1.81
Acid Phosphorus, Purified, 30% H_3PO_3 M.W. 82.06	....	....	1.72	1.52
Acid Phosphorous, Purified, 50% Sol.	....	....	2.04	1.87
Acid Phospho-Tungstic C.P., Cryst. $P_2O_5 24WO_3\ X\ H_2O$	.59	1.63	5.02	4.82
Acid Phospho-Tungstic Cryst	.48	1.21	4.29	4.10
Acid Phthalic C.P., Anhyd. $C_6H_4(CO)_2O$ M.W. 148.07	.14	.30	.79	.74

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*Case and bottles $5.50 extra and returnable.

***Case and bottles included.

**Carboy $5.00 extra and returnable.

****Container extra and returnable.

	1 oz. Each	¼ lb. Each	1 lb. Each	5 lbs. Per lb.
Acid Phthalic Anhyd., Resublimed	....	$ .21	$ .53	$ .74
Acid Picramic (For Blood Test) $C_6H_2.OH.NH_2.NO_2.NO_2$ (1:2:4:6) M.W. 199.09	$ .94	3.68	....	....
Acid Picric C.P., Cryst. $(NO_2)_3C_6H_2OH$ M.W. 229.08 (Trinitrophenol)	.20	.52	1.52	....
Acid Picric C.P., Cryst. (Special for Blood Test. Shipped as Medicine	.39	1.13	3.47	....
Acid Picric U.S.P., Cryst. (10% Water Added) M.W. 229.05	....	.37	1.14	....
Acid Propionic, Pure $CH_3CH_2.COOH$ M.W. 74.06	.25	.42	1.06	....
Acid Pyrogallic C.P., Cryst. $C_6H_3(OH)_3$ M.W. 126.08	.33	.99	3.07	3.02
Acid Pyrogallic U.S.P., Resublimed (Pyrogallol)	....	....	2.82	2.80
Acid Pyrogallic U.S.P., Cryst.	....	....	2.18	2.12
Acid Pyroligneous, Purif.	....	....	.34	....
Acid Rosolic—See Corraline.				
Acid Salicylic C.P., Cryst. $C_6H_4(OH)COOH$ (1:2) M.W. 138.08	.14	.35	.96	.90
Acid Salicylic U.S.P., Needle Cryst.	....	.21	.66	.64
Acid Salicylic U.S.P., Powd.	....	.21	.66	.64
Acid Silicic C.P., Powd. $SiO_2.H_2O$	.17	.43	1.22	1.17
Acid Silico-Fluoric—See Acid Hydrofluosilicic.				
Acid Silico-Tungstic C.P., Cryst. $SiO_212WO_3.26H_2O$ M.W. 3312.52	1.26	4.36	14.40	....
Acid Sodium Phosphate—See Sodium Phosphate Primary.				
Acid Stearic U.S.P., Lumps $C_{17}H_{35}COOH$ M.W. 284.38	....	....	.44	.42
Acid Stearic, Lump, (Purified by Alcohol)	....	....	.62	....
Acid Stearic, U.S.P., Powd.	....	....	.49	.47
Acid Succinic C.P., Cryst. $(CH_2COOH)_2$ M.W. 118.07	.27	.79	2.41	2.35
Acid Succinic, Purified, Cryst.	....	....	1.21	1.14
Acid Sulphanilic C.P., Cryst. ACS $C_6H_4.SO_3H.NH_2(1:4)+2H_2O$ M.W. 209.19	.25	.73	2.22	2.17
Acid Sulphanilic, Tech., Cryst.	....	....	1.55	....
Acid Sulfosalicylic C.P., Cryst.	.62	1.85	5.53	4.55
Acid Sulphuric C.P. ACS (Sp. Gr. 1.84) H_2SO_4 M.W. 98.08 9-lb. gsb., $ **.24 lb.;** 10x9-lb. case, $ **.19 lb.*****; 178-lb. carboy, $ **.11½ lb.****	....	....	.49	....
Acid Sulphuric C.P. Spec. ACS (As. and N Free) 9-lb. gsb., $ **.26 lb.;** 180-lb. carboy, $ **.13 lb.****	....	....	.51	....
Acid Sulphuric C.P., Fuming (15% SO_3) 9-lb. gsb., $ **.46 lb.**	....	....	.72	....
Acid Sulphuric C.P., Fuming (20 to 30% SO_3) 9-lb. gsb., $ **.52 lb.**	....	....	.78	....
Acid Sulphuric U.S.P., Same price as C.P.				
Acid Sulphuric, Com'l. 66° Be. H_2SO_4 (Sp. Gr. 1.835) (15.3 lb. per gal.) 9-lb. gsb., $ **.09 lb.;** 1-gal. jug, **$1.05 gal.;** 5-gal. jug, **$ .90 gal.;** 175-lb. carboy, **$3.85 cwt.****; 1500-lb. drum, **$2.00 cwt.*******	....	....	.30	....
Acid Sulphuric, Electrolyte, (Battery acid). Sp. Gr. 1.835, 175-lb. carboy, **$3.95 cwt.****; Sp. Gr. 1.400, 135-lb. carboy, **$3.95 cwt.****; Sp. Gr. 1.225, 120-lb. carboy, **$3.95 cwt.****				
Acid Sulphuric, Cream Test (Sp. Gr. 1.826) 175-lb. carboy, **$4.10 cwt.****				
Acid Sulphuric, Tech., Fuming (20%) 9-lb. gsb., $ **.25 lb.**	....	....	.52	....
Acid Sulphurous C.P., Solution, (6%) ACS (Sulphur Dioxide Solution) H_2SO_3 M.W. 82.07	....	....	.57	.38
Acid Tannic C.P., Cryst. $C_{14}H_{10}O_9$ M.W. 322.15	.22	.60	1.77	....
Acid Tannic U.S.P., Powd. (Tannin)	....	.37	1.29	1.26
Acid Tannic U.S.P. (Light Fluffy)	.18	.40	1.43	1.35
Acid Tannic, Tech., Powd.	....	....	.74	.72
Acid Tartaric C.P., Powd. or Cryst. ACS $C_2H_2(OH)_2(COOH)_2$ M.W. 150.07 25-lb. keg, $ **.56 lb.**	....	.31	.82	.77
Acid Tartaric U.S.P., Cryst.	....	....	.49	.46
Acid Tartaric U.S.P., Gran. or Powd.	....	....	.49	.46
Acid Trichloracetic C.P. $CC1_3(COOH)$ M.W. 163.40	.51	1.35	4.11	3.98
Acid Trichloracetic U.S.P.	....	1.00	3.45	3.25
Acid Tungstic, Purified, Powd.	.43	1.25	4.55	....
Agar Agar U.S.P., Shreds	....	.56	2.03	....
Agar Agar U.S.P., Powd.	....	.57	2.09	....
Albumen Egg (Scales)	.29	.56	1.91	1.82
Albumen Egg, Impalp. Powd. (Soluble)	.36	.59	2.04	1.95
Alcohol Amyl C.P. Normal $C_5H_{11}OH$ M.W. 88.12	....	.47	1.34	1.29
Alcohol Amylic C.P. (Iso) ACS 25-lb. can, $ **.98 lb.**	....	.46	1.31	1.26
Alcohol Amylic (Fusel Oil)	....	....	.59	.53
Alcohol Amylic, Purified (For Milk Analysis)	....	.39	1.05	1.00
Alcohol Benzyl C.P. $C_6H_5.CH_2OH$ M.W. 108.10	.23	.65	1.95	....
Alcohol, Butyl Normal C.P. $CH_3(CH_2)_2CH_2OH$ M.W. 74.10	....	....	.49	.44
Alcohol, Ethyl, Special Denatured $C_2H_5.OH$ M.W. 46.06 **(Solvent Alcohol)** (6.8 lb. per gal.) 1 gal., **$1.05 gal.;** 5 gal., **$ .85 gal.;** 53-gal. drum, **$ .70 gal.**	....	....	.54	.46
Alcohol, Methyl, Refined 97% (Methanol) (Columbian Spirits) CH_3OH M.W. 32.03 (6.8 lb. per gal.) 1-gal. can, **$1.10 gal.;** 5-gal. can, **$ .90 gal.**	....	....	.56	.47
Alcohol, Methyl C.P., Absolute ACS (Methanol) 1-gal. can, **$2.97 gal.;** 5-gal. demj., **$2.23 gal.*******	....	....	.61	.56
Alcohol, Methyl, C.P., Absolute Special ACS Low in Acetone 1-gal. can, **$3.08 gal.;** 5-gal. demj., **$2.56 gal.*******	....	....	.70	.65

*Case and bottles $5.50 extra and returnable.

**Carboy $5.00 extra and returnable.

***Case and bottles included.

****Container extra and returnable.

	1 oz. Each	¼ lb. Each	1 lb. Each	5 lbs. Per lb.
Alcohol, Propyl (Iso) C.P. 99% $CH_3CH_2.CH_2OH$ M.W. 60.08	....	$ .21	$ .48	$ .43
Alcohol, Propyl (Iso) Tech. 1-gal. can, **$1.25 gal.**				
Aloin U.S.P., Powd.	$ .36	1.04	3.87	3.78
Alphadimethylglyoxime—See Dimethyl Glyoxime.				
Alum—See Aluminum Potassium Sulphate.				
Alum Ammonium—See Aluminum Ammonium Sulphate.				
Alum Ferric-Ammonio—See Ferric Ammonium Sulphate.				
Alum Chrome—See Chromium Potassium Sulphate.				
Alum Chrome-Potassium (Photo) $Cr_2(SO_4)_3.K_2SO_4.24H_2O$ M.W. 998.85	....	....	.26	.23
Alum Filter—See Aluminum Ammonium Sulphate; Also Aluminum Sulphate.				
Alum Potassium—See Aluminum Potassium Sulphate.				
Alum Potassium (Photo) $Al_2(SO_4)_3.K_2SO_4.24H_2O$ M.W. 948.82 25-lb. drum, **$ .12 lb.**	....	....	.16	.15
Alumina—See Page 107.				
Aluminon (Aurin Tricarboxylic Acid—Ammonium Salt) 5-gram bottle, **$4.00.**				
Aluminum Metal, Dust Al At. Wt. 27.00	....	.46	1.34	1.27
Aluminum Metal, Foil	....	.35	1.17	....
Aluminum Metal, Granular (8 to 16 mesh)	....	.26	.72	.69
Aluminum Metal, Granular (20 mesh)	....	.36	1.07	1.00
Aluminum Metal, Granular (30 mesh and finer)	....	.29	.85	.81
Aluminum Metal Squares, Plain, 1/16″ thick x1½″ square, As used in copper determinations Per C, **$3.50.**				
Aluminum Metal Squares, Bent, 1/16″ thick x1½″ square. Two alternate corners bent in opposite directions. Per C, **$4.50.**				
Aluminum Metal, Sheet, 1/16″	....	....	.91	1.27
Aluminum Metal, Sticks	....	....	1.08	....
Aluminum Metal, Turnings	....	....	1.86	....
Aluminum Wire, 99.99% C.P. (Reducing Agent for Iron Determination by $KMnO_4$ Method)	.30	.90	2.83	....
Aluminum Acetate C.P., Basic Powd.	....	.56	1.63	1.57
Aluminum Acetate, Basic Powd., Purified	.23	.35	.94	.85
Aluminum Ammonium Sulphate C.P., Cryst. $Al_2(SO_4)_3(NH_4)_2SO_4.24H_2O$ M.W. 906.66	....	.21	.47	.42
Alum Ammonium Sulphate U.S.P. (Aluminum Ammonium Sulphate) Lump	....	....	.21	.18
Aluminum Ammonium Sulphate (Alum Ammonium) U.S.P. Powd.	....	....	.22	.20
Aluminum Chloride C.P., Cryst. $Al_2Cl_6.6H_2O$ M.W. 241.48 25-lb. jar, **$ .55 lb.**	.20	.30	.78	.73
Aluminum Chloride C.P., Anhyd.	....	.64	1.69	1.50
Aluminum Chloride, NF, Cryst.	.13	.21	.56	.51
Aluminum Chloride, Tech., Cryst., White	....	....	.48	....
Aluminum Chloride, Tech. (Anhydrous, Sublimed)	....	.33	.73	.56
Aluminum Fluoride C.P., Powd. AlF_3 M.W. 84.00 25-lb. keg, **$1.29 lb.**	....	.57	1.66	1.61
Aluminum Hydroxide C.P., Powd. $Al(OH)_3$ M.W. 78.02 25-lb. keg, **$ .63 lb.**	....	.30	.78	.73
Aluminum Hydroxide U.S.P., Powd.	....	....	.46	.40
Aluminum Nitrate C.P., Cryst. $Al(NO_3)_3.9H_2O$ M.W. 375.28 25-lb. jar, **$ .69 lb.**	....	.35	.94	.88
Aluminum Nitrate, Purified, Cryst.	....	....	.81	.75
Aluminum Oxide C.P., Ignited Powd. Al_2O_3 M.W. 102.00 25-lb. can, **$ .49 lb.**	....	1.30	.78	.73
Aluminum Phosphate $AlPO_4$ M.W. 122.04	....	.46	1.13	1.11
Aluminum Potassium Sulphate C.P., Cryst. ACS $Al_2(SO_4)_3.K_2SO_4.24H_2O$ M.W. 948.82 25-lb. keg, **$ .25 lb.**	....	.21	.47	.42
Aluminum Potassium Sulphate U.S.P. (Alum Potassium) Cryst. and Lump	....	....	.21	.18
Aluminum Potassium Sulphate U.S.P. (Alum Potassium) Powd.	....	....	.22	.20
Aluminum Potassium Sulphate U.S.P. Powd. Dried (Burnt Alum Potassium)	....	....	.46	.42
Aluminum Sodium Sulphate C.P. $Al_2(SO_4)_3.Na_2SO_4.24H_2O$ M.W. 916.62	.14	.33	.87	.82
Aluminum Sodium Sulphate, Tech. 100-lb. bbl., **$9.00 cwt.;** 100-lb. bbl., **$8.00 cwt.**	....	....	.40	.30
Aluminum Sodium Sulphate C.P., Dried $Al_2(SO_4)_3.Na_2SO_4$ M.W. 484.24	....	.49	1.21	....
Aluminum Sulphate C.P., Cryst. $Al_2(SO_4)_3.18H_2O$ M.W. 666.47 25-lb. keg, **$ .47 lb.**	....	.29	.72	.66
Aluminum Sulphate C.P., Powd., Dried $Al_2(SO_4)_3$ M.W. 342.18	....	.53	1.44	1.39
Aluminum Sulphate, NF, Gran.	....	....	.38	.35
Aluminum Sulphate, NF, Powd	....	....	.40	....
Aluminum Sulphate, Tech., Gran. (So-called "Iron Free")	....	....	.20	.17
Aluminum Sulphate, Ground Bulk (Filter Alum) 100-lb. bag, **$3.00 cwt.** 200-lb. bag, **$2.75 cwt.;** 20-200-lb. bags, **$2.10 cwt.**				
Aluminum Sulphide Al_2S_3 M.W. 150.18	....	1.25	3.98	....
Aluminum Trioxide—See Aluminum Oxide.				
Alundum R. R.—See Page 107.				
Amidobenzene—See Aniline Oil.				
Amidopyrine U.S.P. Powd. or Gran. (Aminopyrine)	.47	1.51	5.72	....
Ammonia Aqua—See Ammonium Hydroxide.				
Ammonia Water—See Ammonium Hydroxide.				

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*Case and bottles $5.50 extra and returnable.

**Carboy $5.00 extra and returnable.

***Case and bottles included.

****Container extra and returnable.

	1 oz. Each	¼ lb. Each	1 lb. Each	5 lbs. Per lb.
Ammonia, Anhydrous—For refrigeration NH_3 M.W. 17.03.				
50-lb. cylinders, **$30.00 cwt.******; 100-lb. cylinders, **$24.00 cwt.******;				
150-lb. cylinders, **$24.00 cwt.******				
Ammonium Acetate C.P., Cryst. ACS $NH_4(CH_3COO)$ M.W. 77.07	$ .13	$ .31	$ .82	$ .77
25-lb. jar, **$ .59 lb.**				
Ammonium Acetate, Purified, Cryst.	....	.26	.68	.62
Ammonium Arsenate C.P., Cryst. $(NH_4)_2HAsO_4$ M.W. 176.05	.38	1.09	3.35	....
Ammonium Benzoate U.S.P. $C_6H_5COONH_4$ M.W. 139.12	.22	.51	1.73	1.68
Ammonium Bicarbonate C.P., Powd. NH_4HCO_3 M.W. 79.05	....	.25	.59	.53
25-lb. keg, **$ .36 lb.**				
Ammonium Bicarbonate, Purif., Powd.	....	....	.35	....
Ammonium Bichromate C.P., Cryst. (Ammonium Dichromate) $(NH_4)_2Cr_2O_7$ M.W. 252.08	.23	.40	1.11	1.05
Ammonium Bichromate Cryst.	....	.28	.74	.69
Ammonium Bichromate, Gran. (Photo)	....	....	.83	.78
Ammonium Bichromate, Tech., Cryst.	....	....	.83	.78
Ammonium Bifluoride, Purified (Ammonium Fluoride Acid) $NH_4F.HF$ M.W. 57.05	....	....	.60	....
Ammonium Biphosphate—See Ammonium Phosphate Primary.				
Ammonium Bisulphate C.P., Cryst. NH_4HSO_4 M.W. 115.11	....	....	.85	.79
Ammonium Bisulphate, Purified, Cryst.	....	....	.55	....
Ammonium Bisulphite C.P., (Conc. Sol.) NH_4HSO_3 M.W. 99.11	....	.33	.68	.48
Ammonium Bitartrate C.P., Cryst. $NH_4HC_4H_4O_6$ M.W. 167.10	....	.55	1.52	....
Ammonium Borate C.P., Cryst. $(NH_4)_2O.5B_2O_3.8H_2O$ M.W. 545.21	....	.56	1.55	....
Ammonium Bromide C.P., Gran. NH_4Br M.W. 97.96	.26	.38	1.03	.98
Ammonium Bromide U.S.P., Gran.	....	.25	.69	.64
Ammonium Carbonate C.P., Lump ACS	....	.23	.56	.51
25-lb. jar, **$ .40 lb.**				
Ammonium Carbonate C.P., Cubes, ACS	....	.26	.65	.60
25-lb. jar, **$ .41 lb.**				
Ammonium Carbonate U.S.P., Lump	....	....	.38	.24
10-lb. can, **$ .23 lb.**				
Ammonium Carbonate, Purified, Powd.	....	....	.39	.34
Ammonium Carbonate U.S.P., ½″ cubes	....	.21	.55	.49
Ammonium Carbonate U.S.P., ⅜″ cubes	....	.22	.60	....
Ammonium Chloride C.P., Gran. ACS NH_4Cl M.W. 53.50	....	.22	.49	.44
25-lb. keg, **$ .28 lb.**				
Ammonium Chloride U.S.P., Gran. (Sal Ammoniac)	....	....	.36	.34
Ammonium Chloride U.S.P., Powd. (Sal Ammoniac)	....	....	.39	.36
25-lb. drum, **$ .23 lb.**				
Ammonium Chloride, Purified, Lump (Sal Ammoniac)	....	....	.39	.34
Ammonium Chloride, Tech., Bulk, White Gran. (Sal Ammoniac) 5 lbs., **$13.00 cwt.;**				
10 lbs., **$12.00 cwt.;** 25 lbs., **$11.00 cwt.;** 50 lbs., **$10.00 cwt.;**				
100 lbs., **$9.00 cwt.;** 275-lb. bbls., **$8.00 cwt.**				
Ammonium Chloride, Lump, Bulk	....	....	....	.23
10 lbs., **$ .21 lb.;** 25 lbs., **$ .20 lb.;** 50 lbs., **$ .19 lb.**				
Ammonium Chromate C.P., Powd. $(NH_4)_2CrO_4$ M.W. 152.08	....	.72	2.15	2.09
Ammonium Chromate, Purified, Powd.	....	....	1.17	....
Ammonium Chromium Sulphate—See Chromium Ammonium Sulphate.				
Ammonium Citrate C.P., Cryst. $(NH_4)_2HC_6H_5O_7$ M.W. 226.16	.21	.51	1.69	1.64
Ammonium Citrate, Purified, Gran.	....	.41	1.34	1.29
Ammonium Dichromate—See Ammonium Bichromate.				
Ammonium Fluoride C.P., Cryst. NH_4F M.W. 37.04	....	.92	2.44	....
Ammonium Fluoride Acid—See Ammonium Bifluoride.				
Ammonium Formate C.P., Cryst. NH_4COOH M.W. 63.05	....	.55	1.59	....
Ammonium Hydrosulfide—See Ammonium Sulfide.				
Ammonium Hydroxide C.P. Sp. Gr. 0.90 NH_4OH M.W. 35.04	....	....	.56	....
4½-lb. gsb., **$ .34 lb.;** 10x4½-lb. case, **$ .31½ lb.***;** 90-lb. carboy, **$ .16 lb.****				
Ammonium Hydroxide C.P. Special ACS (Pyridine Free)	....	....	.53	....
4-lb. gsb., **$ .33 lb.;** 95-lb. carboy, **$ .11 lb.****				
Ammonium Hydroxide U.S.P., 26° Be (28% Stronger Ammonia) (Sp. Gr. 0.897)	....	....	.27	....
Ammonium Hydroxide, 20° Be 17.5% (Diluted Ammonia Water)	....	....	.27	.22
Ammonium Hydroxide, Com'l., 26-28% (7½ lb. per gal.) (Ammonia Water—Aqua Ammonia)	....	....	.40	.19
1-gal. jug, **$1.15 gal.;** 5-gal. jug, **$1.10 gal.;** 100-lb. carboy, **$8.00 cwt.**;**				
750-lb. drum, **$5.50 cwt.******				
Ammonium Hypophosphite, N.F. $NH_4H_2PO_2$ M.W. 83.10	.22	.52	1.79	1.73
Ammonium Iodide C.P. NH_4I M.W. 144.96	.61	2.05	6.64	....
Ammonium Iodide, NF NH_4I M.W. 144.96	.40	1.25	4.68	4.56
Ammonium Meta Vanadate C.P.	.45	1.50	5.00	....
Ammonium Molybdate C.P., Fine Cryst. $(NH_4)_6Mo_7O_{24}.4H_2O$ M.W. 1236.30	.22	.62	1.87	1.82
25-lb. keg, **$1.47 lb.**				
Ammonium Molybdate, HNO_2 Sol. (According to Blair for Phos. Det.)	....	.42	.99	....
Ammonium Muriate—See Ammonium Chloride.				
Ammonium Nitrate C.P., Gran. ACS NH_4NO_3 M.W. 80.05 25-lb. keg, **$ .45 lb.**	.22	.27	.69	.64
Ammonium Nitrate, Purified, White Gran.	....	....	.47	.42
Ammonium Nitrate, Tech., Gran. 98-100% 25-lb. drum, **$ .25 lb.**	....	....	.35	.30
Ammonium Nitrate, Liquid (Approx. 18% NH_4NO_2)	....	.34	.83	....

*Case and bottles $5.50 extra and returnable.
***Case and bottles included.

**Carboy $5.00 extra and returnable.
****Container extra and returnable.

	1 oz. Each	¼ lb. Each	1 lb. Each	5 lbs. Per lb.
Ammonium Nitrosobetaphenylhydroxylamine—See Cupferron.				
Ammonium Oxalate C.P., Fine Cryst. $(NH_4)_2C_2O_4.H_2O$ M.W. 142.11	$ .25	$ .30	$ .79	$ .74
Ammonium Oxalate C.P., Large Cryst. ACS	.27	.35	.82	.77
Ammonium Oxalate, Purified, Cryst.	....	.19	.51	.48
Ammonium Perchlorate C.P., Cryst. NH_4ClO_4 M.W. 117.50	....	.55	1.52	1.47
Ammonium Persulphate C.P., Cryst., ACS $(NH_4)_2S_2O_8$ M.W. 228.20 25-lb. jar, **$ .49 lb.**	....	.25	.60	.55
Ammonium Persulphate, Purified, Cryst. 98%	....	.20	.51	.46
Ammonium Phosphate C.P., Primary Cryst. (Dihydrogen) NHHPO M.W. 115.10 25-lb. keg, **$ .70 lb.**	.25	.36	.98	.92
Ammonium Phosphate, Purified, Primary Cryst. (Dihydrogen)	....	....	.52	.47
Ammonium Phosphate, Tech., Primary Cryst.	....	....	.39	.36
Ammonium Phosphate C.P., Secondary Cryst. ACS (Diammonium) $(NH_4)HPO_4$ M.W. 132.13	.25	.34	.92	.87
Ammonium Phosphate, NF, Secondary Cryst.	....	.26	.77	.72
Ammonium Phosphate, Tech., Secondary	....	....	.49	.44
Ammonium Polysulphide—See Ammonium Sulphide Dark.				
Ammonium Salicylate U.S.P., Powd. $C_6H_4(OH)COONH_4$ M.W. 155.12	....	....	1.70	1.64
Ammonium Sulphate C.P., Gran. ACS $(NH_4)_2SO_4$ M.W. 132.14 25-lb. keg, **$ .26 lb.**	....	.21	.48	.43
Ammonium Sulphate C.P., Spec. Gran. ACS (Pyridine Free)	....	.31	.81	.75
Ammonium Sulphate, Purified, White Gran. 25-lb. keg, **$ .15 lb.**	....	....	.30	.27
Ammonium Sulphate, Gran., Bulk 10 lbs., **$ .07 lb.;** 25 lbs., **$ .06 lb.** 50 lbs., **$ .04 lb.;** 100 lbs., **$3.25 cwt.;** 500 lbs., **$2.75 cwt.;** 1000 lbs., **$2.60 cwt.;** 2000 lbs., **$2.40 cwt.**	....	....	....	.08
Ammonium Sulphide C.P. (Hydro Sol.) (Light and Dark—Specify Which) NH_4HS. M.W. 51.11	....	.22	.52	.47
Ammonium Sulphite C.P., Cryst. $(NH_4)_2SO_3H_2O$ M.W. 134.16 25-lb. jar, **$ .71 lb.**	....	.39	.96	.91
Ammonium Sulphite, Pure, Cryst.	....	....	.82	.77
Ammonium Sulphohydrate—See Ammonium Sulphide Light.				
Ammonium Tartrate C.P., Cryst. $(NH_4)_2C_4H_4O_6$ M.W. 184.13	.33	.48	1.38	1.33
Ammonium Tartrate, Purified, Neutral, Cryst.	....	....	1.13	1.08
Ammonium Thiocyanate C.P., Cryst. (Ammonium Sulphocyanide or Sulphocyanate) NH_4SCN M.W. 76.11 25-lb. keg, **$1.38 lb.**	.21	.59	1.74	1.69
Ammonium Thiocyanate C.P., Special ACS	.22	.61	1.79	1.74
Ammonium Thiocyanate, Purified, Cryst. (Sulphocyanide or Sulphocyanate)	....	.38	1.24	1.18
Ammonium Thiocyanate, Tech., Cryst.	....	....	1.22	1.17
Ammonium Tungstate C.P., $5(NH_4)_2O.12WO_3+12H_2O$ M.W. 3260.59	.60	1.60	6.00	....
Ammonium Valerate, NF, Cryst.	.44	1.40	5.33	5.28
Amyl Acetate, Purified, Liquid (Pear Oil) $CH_3COO.C_5H_{11}$ M.W. 130.15	....	.20	.52	.47
Amyl Acetate, Bulk (7.26 lb. per gal.) 1 pt., **$ .30 ea.;** 1 qt., **$ .55 ea.;** 1 gal., **$1.85 gal.**				
Amyl Nitrite U.S.P. $(CH_3)_2CH.CH_2CH_2.O.NO$ M.W. 117.12	.37	.78	2.54	2.34
Anhydrone	....	1.48	4.16	....
Aniline C.P. ACS $C_6H_5NH_2$ M.W. 93.06	.25	.33	.85	....
Aniline, Purified (Aniline Oil) $C_6H_5.NH_2$ M.W. 93.09	....	....	.51	.44
Aniline Hydrochloride C.P., Cryst. (Aniline Chloride) $C_6H_5NH_2HC1$ M.W. 129.56	....	.49	1.40	....
Aniline Hydrochloride, Cryst. (Aniline Chloride)	....	....	1.00	.95
Aniline Sulphate C.P., Cryst. $(C_6H_5NH_2)_2H_2SO_4$ M.W. 284.27	....	.34	.90	.85
Annite, Red Label (Detergent) Case of 6 5-lb. cans, **$4.75 case**	....	....	.25	.18
Anthracene $C_6H_4(CH)_2C_6H_4$ M.W. 178.15	.29	.78	2.37	....
Anthraquinone C.P. $C_6H_4(CO)_2C_6H_4$ M.W. 208.13	.22	.36	1.20	....
Antimony Metal C.P., Lumps, Sb At. Wt. 120.20	....	.33	.85	.81
Antimony Metal, Lumps	....	.25	.70	.66
Antimony Metal, Powder, 20 mesh and finer	....	.27	.88	.85
Antimony Chloride—See Antimony Pentachloride and Trichloride.				
Antimony Oxide—See Antimony Trioxide.				
Antimony Pentachloride C.P., Liquid (Fuming) $SbCl_5$ M.W. 297.50	.29	.62	1.46	1.26
Antimony Pentoxide (ic), Powd. Sb_2O_5 M.W. 320.40	....	.51	1.50	....
Antimony Potass. Tartrate C.P., Cryst. $K(SbO)C_4H_4O_6.\frac{1}{2}H_2O$ M.W. 332.36	.18	.48	1.38	1.33
Antimony Potassium Tartrate U.S.P. (Tartar Emetic)	....	.19	.59	.56
Antimony Sulphate C.P. $Sb_2(SO_4)_3$ M.W. 528.58	.40	.77	2.21	....
Antimony Sulphide, Red, Powd. (Antimony Trisulphide Red) Sb_2S_5 M.W. 400.70	....	.25	.81	.78
Antimony Sulphide, Black, Powd. (Antimony Trisulphide Black) Sb_2S_3 M.W. 336.58	....	.21	.49	.47
Antimony Trichloride C.P., Cryst. (Antimony Chloride Tri.) $SbCl_3$ M.W. 226.58	.30	.60	1.56	1.37
Antimony Trichloride Purified, Cryst.	....	.51	1.29	1.09
Antimony Trichloride Tech., Cryst.	....	....	.98	.78
Antimony Trichloride Solution (Butter of Antimony—Sp. Gr. 1.50) 7-lb. gsb., **$ .43 lb.**	....	....	.65	....
Antimony Trioxide C.P., Powd. Sb_2O_3 M.W. 288.40	.18	.40	1.11	1.05
Antimony Trioxide	....	.22	.57	....
Antipyrine U.S.P., Cryst.	.30	.85	3.12	3.04
Apiol	.25	.59	2.05	2.00
Aqua Ammonia—See Ammonium Hydroxide.				
Argols Powd.	....	....	.47	.42
Argols, Crude, Bulk, For Assaying 5 lbs., **$17.00 cwt.;** 10 lbs., **$16.00 cwt.;** 25 lbs., **$14.00 cwt.;** 50 lbs., **$12.00 cwt.;** 100 lbs., **$10.00 cwt.**				

*Case and bottles $5.50 extra and returnable.

**Carboy $5.00 extra and returnable.

***Case and bottles included.

****Container extra and returnable.

	1 oz. Each	¼ lb. Each	1 lb. Each	5 lbs. Per lb.
Arsenic Metal, Pure, Lump As At. Wt. 74.96	$ .26	$ .36	$1.18	$1.12
Arsenic, Metal, Pure, Powd.	.27	.47	1.60	....
Arsenic, White, Bulk 10 lbs., **$ .20 lb.;** 25 lbs., **$ .15 lb.**	....	....	.25	....
Arsenic Chloride C.P. $AsCl_3$ M.W. 181.34	....	.67	1.72	....
Arsenic Chloride Liquid	.59	.79	2.02	....
Arsenic Pentoxide—See Acid Arsenic.				
Arsenic Sulphide, Red, Powd. As_2S_2 M.W. 214.04	....	.30	.53	.47
Arsenic Sulphide, Yellow, Powd. (Superficial) As_2S_3 M.W. 246.10	....	.30	.57	.52
Arsenic Trioxide—See Acid Arsenious.				
Asbestos, Com'l.—See Page 4.				
Asbestos, Powminco, Extra long fibre, Unwashed	.65	1.37	4.40	....
Asbestos, Powminco, Long Fibre, Washed in Acid	.52	1.05	4.00	....
Asbestos, Powminco, Long Fibre, Washed and Ignited	....	1.13	4.36	4.29
Asbestos, Powminco, Medium Fibre, Unwashed	.33	.77	2.40	....
Asbestos, Powminco, Medium Fibre, Washed in Acid (For Gooch Filters)	....	.79	3.00	2.95
Asbestos, Powminco, Medium Fibre, Washed and Ignited	.46	1.05	3.35	3.30
Asbestos, "C" Wooly	....	....	2.00	1.95
Asbestos, Platinized 5% ¼ oz., **$2.54**	9.10	....	....	....
Aspirin—See Acid Acetylsalicylic.				
Ascarite	....	....	4.10	....
Azolitmin Indicator ⅛-oz. bottle, **$5.85;** 10-gram bottle, **$2.50;** 25-gram bottle, **$5.00.**				
Balsam, Canada, Natural	.35	.85	3.00	2.90
Balsam, Canada, Natural, in Xylol	.35	.85	3.00	2.90
Balsam, Canada, Neutral, Filtered	.45	1.40	4.50	4.30
Balsam, Canada, Neutral, in Xylol	.45	1.40	4.50	4.30
Balsam, Canada, Neutral, Dry Powd.	.55	1.55	5.50	....
Balsam, Fir, Oregon	....	.38	.98	....
Barium Acetate C.P., Cryst. $Ba(CH_3COO)_2.H_2O$ M.W. 273.45	....	.47	1.30	1.21
Barium Acetate C.P., Special Cryst. ACS (Low in Sr and Ca Salts)	....	.53	1.47	....
Barium Bromate C.P. $Ba(BrO_3)_2+H_2O$ M.W. 411.23	....	.96	2.96	2.91
Barium Bromide C.P. $BaBr_2+2H_2O$ M.W. 333.24	....	.73	2.21	2.16
Barium Bromide, Pure	.20	.41	1.34	1.29
Barium Carbonate C.P., Powd. $BaCO_3$ M.W. 197.38	....	.36	1.00	.95
Barium Carbonate C.P., Special Powd. ACS (Low in NO_3)	....	.49	1.40	1.35
Barium Carbonate, Purified, Precip.	....	.16	.44	.42
Barium Carbonate, Tech., Bulk 10 lbs., **$ .10 lb.;** 25 lbs., **$ .09 lb.**	....	....	.15	....
Barium Chlorate C.P., Cryst. $Ba(ClO_3)_2.H_2O$ M.W. 322.31	....	.34	.91	.86
Barium Chlorate Tech.	....	....	.60	....
Barium Chloride C.P., Cryst. ACS $BaCl_2.2H_2O$ M.W. 244.32 25-lb. keg, **$ .37 lb.**	....	.25	.60	.55
Barium Chloride C.P., Anhyd. Powd. $BaCl_2$ M.W. 208.29	....	.42	1.08	1.03
Barium Chloride C.P., 20 to 30 mesh (For Parr Calorimeter)	....	....	1.50	1.44
Barium Chloride, Purified, Cryst.	....	....	.34	.31
Barium Chloride, Tech., Bulk 25 lbs., **$ .08 lb.**	....	....	.12	.09
Barium Chromate C.P., Powd. $BaCrO_4$ M.W. 253.37	.29	.49	1.40	....
Barium Dioxide C.P., Powd. (Peroxide) BaO_2 M.W. 169.37	.21	.23	.57	.52
Barium Dioxide C.P., Hydrated $BaO_2.8H_2O$ M.W. 315.50	....	....	2.24	....
Barium Dioxide, Purified, Anhyd., Powd. (Peroxide)	....	.20	.43	.39
Barium Fluoride C.P., Powd. BaF_2 M.W. 175.37	....	....	1.33	....
Barium Hydroxide C.P., Cryst. ACS $Ba(OH)_2.8H_2O$ M.W. 315.51 25-lb. jar, **$ .41 lb.**	....	.26	.65	.60
Barium Hydroxide C.P., Dry Powd.	....	.38	1.01	.96
Barium Hydroxide, Purified, Cryst. (Caustic Baryta)	....	....	.49	.44
Barium Hydroxide, Tech., Cryst.	....	....	.31	.26
Barium Hyposulphite—See Barium Thiosulphate.				
Barium Iodide BaI_2+2H_2O M.W. 427.24	.59	1.64	5.98	5.79
Barium Nitrate C.P., Cryst. ACS $Ba(NO_3)_2$ M.W. 261.39	....	.34	.88	.83
Barium Nitrate, Tech., Powd.	....	....	.34	.31
Barium Nitrate, Tech., Bulk 10 lbs., **$ .22 lb.;** 25 lbs., **$ .20 lb.**	....	....	.28	.25
Barium Oxalate C.P., Powd. $BaC_2O_4.H_2O$ M.W. 243.38	....	.70	2.05	....
Barium Oxide, Hydrated, Powd.—See Barium Hydroxide Dry Powd.				
Barium Perchlorate, Anhyd.—See Desicchlora.				
Barium Peroxide—See Barium Dioxide.				
Barium Phosphate C.P., Powd. (Tertiary) $Ba_3(PO_4)_2$ M.W. 602.12	....	.74	1.98	....
Barium Sulphate C.P., Powd. $BaSO_4$ M.W. 233.43 25-lb. keg, **$ .60 lb.**	....	.33	.86	.81
Barium Sulphate, Tech., Powd.	....	....	.23	.21
Barium Sulphate U.S.P. For "X-Ray" Diagnosis, Powder free, from soluble Barium Salts	....	....	.30	.27
Barium Sulphide, Purified, Yellow, Powd. (Approx. 80%) BaS M.W. 169.43	....	.22	.57	.51
Barium Sulphide, Gray (Approx. 65%)	....	....	.44	....
Barium Sulphide, Black, Tech. (Approx. 70%)	....	....	.39	....
Barium Sulphite C.P., Powd. $BaSO_3$ M.W. 217.43	....	.62	1.77	....
Barium Thiosulphate C.P., Powd. (For Standardizing) $BaS_2O_3.H_2O$ M.W. 267.50	....	.66	1.91	....
Barrett Flotation Reagent No. 4 5-gal. can, **$1.20 gal.;** 50-gal. drum, **$ .70 gal.**				
Barrett Flotation Reagent No. 634 5-gal. can, **$1.20 gal.;** 50-gal. drum, **$ .70 gal.**				
Battery Acid—See Acid Sulphuric (Electrolytic).				

*Case and bottles $5.50 extra and returnable.
**Carboy $5.00 extra and returnable.
***Case and bottles included.
****Container extra and returnable.

	1 oz. Each	¼ lb. Each	1 lb. Each	5 lbs. Per lb.
Barium Thiocyanate, Reagent $Ba(CNS)_2.3H_2O$ M.W. 307.56	....	$ .80	$2.47	....
Bentonite, Bulk 100-lb. bag, **$1.75 cwt.;** 2000 lbs. in bags, **$1.20 cwt.**	....	....	.10	....
Benzaldehyde, NF, Liquid (Artificial Oil Bitter Almond) $C_6H_5.COH$ M.W. 106.08	$ .20	.48	1.63	$1.57
Benzaldehyde, Tech. (Water White Liquid)	....	....	1.53	....
Benzene (Benzol) C.P. ACS (Thiophene Free) C_6H_6 M.W. 78.05 25-lb. demj., **$ .33 lb.******	....	....	.51	.46
Benzene (Benzol) Purified, 99-100%	....	....	.34	.23
Benzidine Base $NH_2.C_6H_4.C_6H_4.NH_2$ M.W. 184.15	.33	.66	1.91	....
Benzidine Acetate C.P.	1.25	....	....	....
Benzidine Hydrochloride C.P. $NH_2.C_6H_4.C_6H_4.NH_2.2HCl$ M.W. 257.11	.82	2.75	8.98	....
Benzidine Sulphate C.P. $C_{12}H_{12}N_2.H_2SO_4$ M.W. 282.25	1.25	....	....	....
Benzine—See Ether Petroleum.				
Benzoin C.P.	.75	2.50	9.00	....
Benzol, (Benzene) 90%, Bulk (7.3 lb. per gal.) C_6H_6 M.W. 78.05 1-gal. can, **$ .95 gal.;** 5-gal. can, **$ .70 gal.;** 10-gal. can, **$ .65 gal.;** 50-gal. drum, **$ .45 gal.******				
Benzoyl Chloride C.P., Liquid C_6H_5COCl M.W. 140.54	....	.46	1.11	....
Benzyl Benzoate 98-100% $C_6H_5COO.C_6H_5CH_2$ M.W. 212.17	.22	.52	1.79	1.74
Benzyl Chloride C.P., Liquid $C_6H_5CH_2Cl$ M. W. 126.55	....	.49	1.24	1.04
Benzyl Chloride, Purified, Liquid	....	....	1.01	....
Betanapthol—See Napthol Beta.				
Bichloride of Mercury—See Mercuric Chloride.				
Bismuth Metal, Lump, 99.8% Bi At. Wt. 209	.23	.61	2.21	2.02
Bismuth Metal C.P. 99.8%	.29	.85	2.60	2.55
Bismuth Metal, Powd	.29	.79	2.90	2.85
Bismuth Acetate, Basic, Powd.	....	1.65	5.23	....
Bismuth Carbonate—See Bismuth Subcarbonate.				
Bismuth Chloride—See Bismuth Trichloride.				
Bismuth Citrate $BiC_6H_5O_7$ M.W. 398.07	.34	.98	3.64	3.59
Bismuth Flux (For Blowpipe Analysis)	.25	.75	2.50	....
Bismuth Hydroxide $Bi(OH)_3$ M.W. 260.02	....	1.15	4.29	4.24
Bismuth Nitrate, Basic—See Bismuth Subnitrate.				
Bismuth Nitrate C.P., Cryst. $Bi(NO_3)_3.5H_2O$ M.W. 485.10	.36	.85	2.41	2.21
Bismuth Nitrate, Purified, Cryst.	.30	.63	1.95	1.76
Bismuth Oxide—See Bismuth Trioxide.				
Bismuth Oxychloride C.P., Powd. $BiOCl$ M.W. 260.46	....	1.51	4.81	....
Bismuth Oxychloride, Purified	.36	1.08	4.03	3.95
Bismuth Peroxide—See Bismuth Tetroxide.				
Bismuth Salicylate, 40% $Bi(C_6H_5.OH.COO)_3$ M.W. 623.25	.27	.67	2.48	2.46
Bismuth Subcarbonate C.P., Powd.	....	1.11	3.45	....
Bismuth Subcarbonate U.S.P. Light Powd.	....	....	1.75	1.70
Bismuth Subcarbonate (For "X-Ray" Diagnosis—Acid Free)	....	.86	3.19	3.14
Bismuth Subgallate U.S.P., Powd. $C_6H_2(OH)_3.COOBi(OH)_2$ M.W. 412.09	.22	.51	1.75	1.70
Bismuth Subnitrate C.P., Powd.	.34	1.05	3.29	3.24
Bismuth Subnitrate U.S.P. (Light Powd.)	.21	.46	1.57	1.52
Bismuth Tetroxide, Purified, Powd. Bi_2O_4 M.W. 482.00	....	1.57	6.01	....
Bismuth Trichloride C.P., Cryst. $BiCl_3$ M.W. 315.37	.53	1.43	4.36	4.16
Bismuth Trichloride, Purified, Cryst. (Bismuth Chloride)	.46	1.11	3.90	3.70
Bismuth Trioxide C.P., Powd. Bi_2O_3 M.W. 466.00	.52	1.64	5.23	....
Bleaching Powder—See Chloride of Lime.				
Blood Albumen	.21	.35	1.02	....
Blue Vitriol—See Cupric Sulphate.				
Bone Ash, Assay Grade $CaHPO_4$				
Grade X, 60 mesh 1-24 lbs., **$ .14 lb.;** 25 lbs., **$ .12 lb.;** 50 lbs., **$ .11 lb.;** 100 lbs., **$9.50 cwt.;** 450-lb. bbl., **$8.00 cwt.**				
Grade XX, 70 mesh 1-24 lbs., **$ .14 lb.;** 25 lbs., **$ .12 lb.;** 50 lbs., **$ .11 lb.;** 100 lbs., **$9.50 cwt.;** 450-lb. bbl., **$8.00 cwt.**				
Grade XXX, 80 mesh 1-24 lbs., **$ .16 lb.;** 25 lbs., **$ .13 lb.;** 50 lbs., **$ .12 lb.;** 100 lbs., **$10.50 cwt.;** 400-lb. bbl., **$8.25 cwt.**				
Grade XXXX, 90 mesh 1-24 lbs., **$ .18 lb.;** 25 lbs., **$ .14 lb.;** 50 lbs., **$ .13 lb.;** 100 lbs., **$ .11 lb.;** 400-lb. bbl., **$8.50 cwt.**				
Bone Ash, Dust, 200 mesh 500-lb. bbl., **$10.50 cwt.**				
Borax, Reagent Grades—See Sodium Borate.				
Borax, Powd., Com'l. $Na_2B_4O_7 5H_2O$ 1-9 lbs., **$ .10 lb.;** 10 lbs., **$ .08 lb.** 25 lbs., **$ .07 lb.;** 100-lb. bag, **$3.20 cwt.;** 320-lb. bbl., **$3.70 cwt.**				
Borax, Fine Granulated, Com'l. 1-9 lbs., **$ .09 lb.;** 10 lbs., **$ .07 lb.;** 25 lbs., **$ .06 lb.;** 100-lb. bag, **$2.95 cwt.**				
Borax Crystals, Com'l. 1-9 lbs., **$ .10 lb.;** 10 lbs., **$10.00 cwt.;** 25 lbs., **$8.00 cwt.** 100 lbs., **$3.25 cwt.;** 300-lb. bbls., **$3.75 cwt.**				
Borax Glass, Assay Grade $Na_2B_4O_7$ (Borax Calcined) 1-9 lbs., **$28.00 cwt.;** 10 lbs., **$25.00 cwt.;** 25 lbs., **$22.00 cwt.;** 50 lbs., **$18.00 cwt.:** 100 lbs., **$17.00 cwt.;** 500 lbs., **$16.50 cwt.;** 1000 lbs., **$16.00 cwt.;** 2000 lbs., **$15.50 cwt.**				
Boric Anhydride, Purified, Powd.	....	.56	1.56	1.50
Bromine C.P. ACS Br At. Wt. 79.92	.36	.68	1.63	....
Bromine, NF	....	.54	1.30	....
Bromine, Tech. 6½-lb. gsb and tin, **$ .86 lb.**	....	....	1.17	....

*Case and bottles $5.50 extra and returnable.

**Carboy $5.00 extra and returnable.

***Case and bottles included.

****Container extra and returnable.

	1 oz. Each	¼ lb. Each	1 lb. Each	5 bs. Per lb.
Bromobenzene, Reagent, Mono	....	....	$ .85	$ .81
Bromoform U.S.P.	....	$ .68	2.44	2.34
Butter of Antimony—See Antimony Trichloride.				
Butyl Acetate $C_4H_9.C_2H_3O_2$ M.W. 116.13	....	....	.29	.25
Butyl-Chloral Hydrate, Powd. $CH_3.CHCl.CCl_2.CH(OH)_2$ M.W. 193.46	$ .56	1.81	6.96	....
Cadmium Metal, Sticks Cd At. Wt. 112.41	.27	.60	1.83	1.79
Cadmium Metal, Mossy	.26	.62	1.90	1.86
Cadmium Acetate C.P., Cryst. $Cd(CH_3COO)_2.2H_2O$ M.W. 266.50	.35	1.09	3.43	3.38
Cadmium Bromide C.P., Cryst. $CdBr_2.4H_2O$ M.W. 344.30	....	.95	2.95	2.90
Cadmium Bromide, Purified, Cryst.	....	.69	2.46	....
Cadmium Carbonate C.P., Powd. $CdCO_3$ M.W. 172.41	....	1.20	3.78	3.73
Cadmium Chloride C.P., Cryst. ACS $CdCl_2.2H_2O$ M.W. 219.35	.29	.85	2.59	2.54
25-lb. jar, **$2.10 lb.**				
Cadmium Chloride, Purified, Cryst.	....	.57	1.99	1.94
Cadmium Chloride C.P., Anhyd. Powd. $CdCl_2$ M.W. 183.3	....	.96	2.96	2.91
Cadmium Hydroxide C.P., Powd. $Cd(OH)_2$ M.W. 146.42	....	1.29	4.13	....
Cadmium Iodide C.P., Cryst. CdI_2 M.W. 366.24	.60	1.95	6.29	6.24
Cadmium Iodide, Purified, Cryst.	....	1.42	5.40	....
Cadmium Nitrate C.P., Cryst. $Cd(NO_3)_2.4H_2O$ M.W. 308.48	.23	.69	2.07	2.02
25-lb. jar, **$1.64 lb.**				
Cadmium Nitrate, Purified, Cryst.	....	.53	1.82	1.77
Cadmium Oxide C.P., Powd. CdO M.W. 128.40	.48	1.57	5.03	....
Cadmium Oxide, Tech., Powd.	....	....	2.08	....
Cadmium Potassium Iodide C.P. $CdI_2.2KI+2H_2O$ M.W. 734.31	.77	2.59	8.39	....
Cadmium Sulphate C.P., Cryst. ACS $3CdSO_4.8H_2O$ M.W. 769.51	.29	.82	2.55	2.50
Cadmium Sulphate C.P., Anhyd. $CdSO_4$ M.W. 208.46	....	1.04	3.25	....
Cadmium Sulphate, Purified, Cryst.	....	.64	2.26	2.21
Cadmium Sulphide, Purif., Powd. CdS M.W. 144.46	....	.78	3.02	....
Caffeine U.S.P.	.35	1.16	4.23	....
Calcite—See Iceland Spar.				
Calcium Metal, Turnings Ca At. Wt. 40.08	.52	1.21	4.52	....
Calcium Acetate C.P., Powd. $Ca(CH_3COO)_2$ M.W. 158.14	....	.42	1.17	1.12
Calcium Acetate, Purified, Powd.	....	....	.65	.60
Calcium Acetate, Tech., Gran.	....	....	.29	....
Calcium Arsenate C.P., Powd. $Ca(AsO_4)_2+3H_2O$ M.W. 470.19	....	.70	2.03	....
Calcium Benzoate, Powd. $Ca(C_6H_5.COO)_2+3H_2O$ M.W. 336.27	....	....	1.43	1.38
Calcium Biphosphate—See Calcium Phosphate Primary.				
Calcium Bromide C.P., Powd. $CaBr_2.2H_2O$ M.W. 235.94	.29	.46	1.31	....
Calcium Bromide U.S.P., Powd.	.18	.36	1.16	1.11
Calcium Carbide, Lump CaC_2 M.W. 64.08 2-lb. can, **$ .20 lb.**	....	....	.29	.18
Calcium Carbonate C.P., Powd. (Precip.) $CaCO_3$ M.W. 100.08	.23	.36	.98	.92
25-lb. keg, **$ .70 lb.**				
Calcium Carbonate C.P., Special (Precip. Low in Alkali)	....	.49	1.43	1.38
25-lb. keg, **$1.08 lb.**				
Calcium Carbonate C.P., Special ACS (Precip. Low in Alkali and Heavy Metals)	....	.61	1.79	1.74
Calcium Carbonate C.P., Special ACS (Precip. Low in N)	....	.49	1.43	....
Calcium Carbonate U.S.P. (Precip. Chalk)	....	.20	.25	.22
Calcium Chlorate, (Weed Killer) $Ca(ClO_3)_2$ M.W. 206.99 50-lb. drum, **$10.00 cwt.;** 100-lb. drum, **$9.50 cwt.;** 200-lb. drum, **$9.00 cwt.**				
Calcium Chloride C.P., Anhyd. ACS (Dried-Lump Pure White) $CaCl_2$ M.W. 110.99	....	.34	.91	.86
25-lb. can, **$ .64 lb.**				
Calcium Chloride C.P., Anhyd. ACS (About 4 Mesh)	....	.30	.75	.70
Calcium Chloride C.P., Anhyd. ACS (12 Mesh and Finer)	....	.30	.75	.70
Calcium Chloride U.S.P., Cryst.	....	....	.53	.47
Calcium Chloride, Purified, Anhyd. (Dried—For Drying Tubes) (Gran.—4 Mesh)	....	.22	.60	.53
(Can also be furnished in 8 mesh.)				
Calcium Chloride, Anhyd. Fused Sticks	....	.47	1.29	1.22
Calcium Chloride C.P., Cryst.	....	.26	.66	.61
25-lb. jar, **$ .43 lb.**				
Calcium Chloride C.P., Special Cryst. ACS	.23	.36	.91	.86
Calcium Chloride, Tech., Anhyd. Lump (Dried—For Desiccator)	....	....	.35	.30
Calcium Chloride, Tech., Anhyd., Gran. (Dried—4 Mesh for Desiccator)	....	....	.39	.34
(Can also be furnished in 8, 12 and 20 Mesh.)				
Calcium Chloride, Flake, 77-80% 10 lbs., **$8.00 cwt.;** 25 lbs., **$6.00 cwt.;** 50 lbs., **$5.00 cwt.;** 100-lb. bag, **$3.43 cwt.;** 200 lbs., **$2.93 cwt.;** 300 lbs., **$2.76 cwt.;** 400-lb. drum, **$2.68 cwt.;** 2000 lbs., **$2.43 cwt.**				
Calcium Chloride, Solid, 77-80% 700-lb. drum, **$2.15 cwt.**				
Calcium Chromate C.P., Powd. (Basic) $CaCrO_4.2H_2O$ M.W. 192.10	....	.79	2.34	....
Calcium Citrate C.P., Powd. $Ca_3(C_6H_5O_7)_2.4H_2O$ M.W. 570.41	....	.69	2.09	....
Calcium Fluoride C.P., Powd. CaF_2 M.W. 78.07	.33	.57	1.69	1.64
Calcium Fluoride, Native, Powd. (Fluorspar)	....	....	.21	.18
Calcium Formate C.P., Cryst. $Ca(HCOO)_2$ M.W. 130.10	....	.46	1.30	....
Calcium Glycerophosphate, NF, Powd. $CaO_2.PO.OC_3H_5(OH)_2$ M.W. 210.18	.23	.58	2.02	1.95
Calcium Hydroxide U.S.P., Powd. (Calcium Oxide Hydrated—Slaked Lime) $Ca(OH)_2$ M.W. 74.09	....	....	.21	.18
Calcium Hydroxide C.P., Powd.	....	....	.62	.57

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*Case and bottles $5.50 extra and returnable.

**Carboy $5.00 extra and returnable.

***Case and bottles included.

****Container extra and returnable.

	1 oz. Each	¼ lb. Each	1 lb. Each	5 lbs. Per lb.
Calcium Hypochlorite U.S.P., Powd. (Chlorinated Lime)	....	$ .22	$ .48	$ .43
Calcium Hypochlorite—See Chloride of Lime.				
Calcium Hypophosphite, NF, Powd. $Ca(H_2PO_2)_2$ M.W. 170.18	....	....	1.08	.98
Calcium Iodide C.P. CaI_2 M.W. 293.91	$ .82	2.44	8.30	....
Calcium Iodide, Purified	.53	1.44	5.20	5.01
Calcium Lactate U.S.P., Powd. $Ca(C_3H_5O_3)_2.5H_2O$ M.W. 308.26	.12	.17	.52	.51
Calcium Nitrate C.P., Cryst. $Ca(NO_3)_2.4H_2O$ M.W. 236.15	.23	.33	.86	.81
25-lb. jar, **$ .62 lb.**				
Calcium Nitrate, Purified, Cryst.	....	.24	.65	.60
Calcium Oxalate C.P., Powd. $CaC_2O_4.H_2O$ M.W. 146.10	....	.94	2.89	2.83
Calcium Oxide, NF, Lump or Powder (Lime) CaO M.W. 56.07	....	....	.30	.26
Calcium Oxide, Hydrated—See Calcium Hydroxide.				
Calcium Peroxide $CaO_2.8H_2O$ M.W. 216.20	....	.65	2.28	1.95
Calcium Phosphate C.P., Primary, Cryst. $Ca(H_2PO_4)_2.H_2O$ M.W. 252.20	....	.47	1.33	1.27
Calcium Phosphate C.P., Secondary, Powd. $CaHPO_4.2H_2O$ M.W. 172.15	.30	.51	1.47	1.42
25-lb. keg, **$1.12 lb.**				
Calcium Phosphate C.P., Tertiary, Powd. $Ca_3(PO_4)_2$ M.W. 310.29	....	.51	1.48	1.43
Calcium Phosphate, Purified, Secondary, Powder	....	.18	.44	....
Calcium Phosphate, NF, Precip., Powd.	....	.22	.33	.30
Calcium Phosphide, Tech.	....	.37	1.30	....
Calcium Sulphate C.P., Powd. $CaSO_4.2H_2O$ M.W. 172.16	....	.26	.66	.61
25-lb. keg, **$ .43 lb.**				
Calcium Sulphate, Purified, Powd.	....	.21	.49	.47
Calcium Sulphate C.P., Powd. (Desiccated)	....	.42	1.13	....
Calcium Sulphate, Precip.	....	....	.36	.34
Calcium Sulphate, Tech., Powd. (Plaster Paris)	....	....	.17	.14
Calcium Sulphate, Native—See Gypsum.				
Calcium Sulphide C.P., Powd.	....	.48	1.44	1.39
Calcium Sulphide U.S.P. (Lime Sulphurated)	....	.26	.75	.69
Calcium Sulphite, Powd. $CaSO_3$ M.W. 120.13	....	.57	1.69	....
Calcium Tartrate C.P., Powd. $CaC_4H_4O_6.4H_2O$ M.W. 260.19	....	.69	2.09	....
Calcium Thiocyanate, Purified, Liquid (Sp. Gr. 1.36 at 70° C)	....	....	2.11	....
Calcium Tungstate C.P. $CaWO_4$ M.W. 288.07	.50	1.40	5.00	....
Calomel—See Mercurous Chloride.				
Camphor Gum U.S.P., Lump	.23	.50	1.56	....
Camphor Monobromated, NF, Cryst. and Powd.	.27	.72	2.60	2.54
Canada Balsam—See Balsam, Canada.				
Carbon, Decolorizing C At. Wt. 12.00	....	....	.47	....
Carbon, Activated, "Aqua", Packed in 35-lb. bags. 35 to 139 lbs., **$12.00 cwt.;** 140 to 699 lbs., **$11.00 cwt.;** 700 lbs., **$10.00 cwt.;** 1400 lbs., **$9.50 cwt.;** 2100 lbs., **$9.25 cwt.**				
Carbon Bisulphide C.P., ACS (Carbon Disulphide) CS_2 M.W. 76.13	....	.21	.48	.43
25-lb. demj., **$ .26 lb.******				
Carbon Bisulphide, (Disulphide), Redistilled	....	....	.37	.31
Carbon Bisulphide, Tech., (Disulphide) (10.5 lb. per gal.)	....	....	.46	.35
1-gal. can, **$2.00 gal.;** 5-gal. drum, **$1.50 gal.**				
Carbon Tetrachloride C.P., ACS CCl_4 M.W. 153.85 25-lb. can, **$ .38 lb.**	.17	.22	.52	.47
Carbon Tetrachloride, Purified	....	....	.31	.25
Carbon Tetrachloride, Tech. (13 lbs. per gal.)	....	....	.21	.32
1-gal. can, **$2.20 gal.;** 5-gal. can, **$1.79 gal.;** 700-lb. drum, **$6.50 cwt.**				
Carborundum, Cryst	.25	....	2.00	....
Carborundum, Powd. Specify mesh desired	.15	....	.50	....
Card Teeth	....	....	.39	.38
Casein, Tech	....	.26	.51	.46
Case Hardener—See Sodium Cyanide.				
Castile Soap, Powd	....	.35	.83	.80
Castor Oil—See Oil Castor.				
Caustic Potash—See Potassium Hydroxide.				
Caustic Soda, Flake, 76% NaOH M.W. 40.01 10-lb. can, **$ .10 lb.;** 50-lb. drum, **$5.70 cwt.;** 100-lb. drum, **$4.95 cwt.;** 400-lb. drum, **$4.35 cwt.**				
Caustic Soda, Solid 76% 720-lb. drum, **$3.95 cwt.**				
Caustic Soda C.P.—See Sodium Hydroxide.				
Cedar Oil (For Clearing)	....	.40	1.10	.95
Cedar Wood Oil (For Immersion) (Refractive Index 1.515 at 18° C)	.30	.60	2.00	1.80
Cement, High Temperature—See Page 333.				
Ceresin—See Wax.				
Ceric Sulphate C.P., Anhydrous	....	1.00	2.50	....
Cerium Nitrate, Purified $Ce(NO_3)_3+6H_2O$ M.W. 434.37	.43	.98	3.33	2.97
Cerium Oxalate, NF, Powd	.13	.22	.68	.65
Chalk, Precipitated—See Calcium Sulphate Prec.				
Charcoal, Bone, Granular	....	....	.33	.27
Charcoal, Bone, Powder	....	.20	.29	.25
Charcoal, Wood, Sticks—See Page 89.				
Charcoal, Wood, Powd. 50-lb. bag, **$3.00 cwt.**	....	....	.23	.20
Chili Saltpetre—See Sodium Nitrate.				
Chloral Hydrate U.S.P., Cryst. $CCl_3.CH(OH)_2$ M.W. 165.41	.20	.39	1.30	1.25

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*Case and bottles $5.50 extra and returnable.

**Carboy $5.00 extra and returnable.

***Case and bottles included.

****Container extra and returnable.

	1 oz. Each	¼ lb. Each	1 lb. Each	5 lbs. Per lb.
Chloride of Lime (30% Chlorine) (Chlorinated Lime) 10-lb. can, **\$1.20 ea.;** 10x10-lb cans, **\$1.10 ea.;** 110-lb. drum, **\$6.00 cwt.;** 300-lb. drum, **\$4.50 cwt.**	....	....	\$ .25	\$ .20
Chlorine, Liquid, For Water Purification Cl At. Wt. 35.46. 100-lb. cylinder, **\$13.00 cwt.******; 150-lb. cylinder, **\$12.00 cwt.******				
Chloral Butyl Hydrate ("Croton" Chloral Hydrate)	\$ .56	\$1.81	6.96	....
Chloramine T U.S.P. $CH_3.C_6H_4SO_2NNaCl.3H_2O$ M.W. 281.67	....	....	2.80	2.67
Chloroform C.P. $CHCl_3$ M.W. 119.39 50-lb. drum, **\$ .40 lb.******	....	.30	.75	.70
Chloroform U.S.P. 7-lb. bottle, **\$ .52 lb.**	....	.22	.59	.53
Chloroform U.S.P., For Anesthesia	....	.22	.59	.53
Chloroform, Tech. (12 lb. 5 oz. to gal.) 1-gal. can, **\$4.00 gal.;** 50-lb. drum, **\$ .30 lb.******	....	....	.46	.39
Chrome Alum—See Chromium Potassium Sulphate.				
Chromic Anhydride—See Acid Chromic.				
Chromic Oxide—See Chromium Oxide.				
Chromium (ic) Acetate C.P. $Cr(C_2H_3O_2)_3+H_2O$ M.W. 247.12	....	.94	2.90	2.85
Chromium (ic) Ammon. Sulphate C.P., Cryst. $Cr_2(SO_4)_3(NH_4)_2SO_4.24H_2O$ M.W. 956.70	....	.57	1.69	1.64
Chromium Bromide C.P., Cryst. $CrBr_3.6H_2O$ M.W. 399.86	.59	1.70	5.30	....
Chromium Carbonate C.P., Basic Powder $CrCO_3$ M.W. 112.01	....	.59	1.76	....
Chromium (ic) Chloride C.P. $CrCl_3$ M.W. 158.38	.20	.53	1.56	1.51
Chromium (ic) Chloride C.P. (50% Solution) $CrCl_3.H_2O$	....	....	1.30	1.25
Chromium (ic) Fluoride, Powd. CrF_3 M.W. 109.00	.39	1.08	3.28	....
Chromium (ic) Hydroxide, Powd. $Cr(OH)_3$ M.W. 103.02	....	.78	2.34	....
Chromium (ic) Nitrate C.P., Gran. $Cr(NO_3)_3+9H_2O$ M.W. 400.17	.18	.49	1.43	1.38
Chromium (ic) Nitrate C.P. (29% Solution)	....	....	1.24	1.18
Chromium Oxalate C.P. $Cr(C_2O_4)+H_2O$ M.W. 158.03	....	.57	1.61	1.56
Chromium (ic) Oxide C.P., Powd. (Chromium Sesquioxide) Cr_2O_3 M.W. 152.00	.29	.48	1.39	1.34
Chromium (ic) Oxide, Tech., Green	....	....	.75	....
Chromium (ic) Potassium Sulphate C.P., Cryst. $Cr_2(SO_4)_3.K_2SO_4.24H_2O$ M.W. 998.82	.23	.29	.73	.68
Chromium (ic) Potassium Sulphate, Tech., Cryst. (Alum Chrome)	....	....	.26	.23
Chromium (ic) Sulphate C.P. $Cr_2(SO_4)_3.15\ H_2O$ M.W. 662.42	.17	.42	1.14	1.09
Chromium (ic) Sulphate C.P. (30% Solution)	....	....	1.22	....
Chromium (ic) Sulphate, Purified	....	.26	.81	.77
Chromium Trioxide—See Acid Chromic.				
Cinchonidine Alkaloid, Cryst. $C_{19}H_{22}N_2O$ M.W. 294.29 25-oz. cans, **\$1.13 oz.**	1.25	....	....	....
Cinchonidine, Precip., Powd. 25-oz. cans, **\$1.09 oz.**	1.21	....	....	....
Cinchonidine Salicylate $C_{19}H_{22}N_2O.C_7H_6O_3$ M.W. 432.37	1.21	....	....	....
Cinchonidine Sulphate, NF $(C_{19}H_{22}N_2O)_2.H_2SO_4+3H_2O$ M.W. 740.70 5-oz. cans, **\$ .70 oz.;** 25-oz. cans, **\$ .66 oz.**	.78	....	....	....
Cinchonidine Alkaloid, Cryst. $C_{19}H_{22}N_2O$ M.W. 294.29 5-oz. cans, **\$ .79 oz.;** 25-oz. cans, **\$ .75 oz.**	.87	3.16	12.00	....
Cinchonidine Bisulphate $C_{19}H_{22}N_2O.H_2SO_4+4H_2O$ M.W. 464.43 5-oz. cans, **\$ .69 oz.**	.77	....	....	....
Cinchonine Hydrochloride $C_{19}H_{22}N_2O.HCl+2H_2O$ M.W. 366.79 5-oz. cannister, **\$ .69 oz.**	.77	....	....	....
Cinchonine Sulphate NF $(C_{19}H_{22}N_2O)_2.H_2SO_4+2H_2O$ M.W. 722.68 5-oz. cans, **\$ .53 oz.;** 25-oz. cans, **\$ .49 oz.**	.61	....	....	....
Cinnabar—See Mercuric Sulphide Red.				
Coal Tar, Refined, Bulk 1-gal. can, **\$ .60 gal.;** 5-gal. cans, **\$ .50 gal.;** 25-gal. drum, **\$ .32 gal.;** 50-gal. drum, **\$ .27 gal.**				
Coal Tar Creosote—See Creosote.				
Cobalt Metal, Cubes, 98-99% Co At. Wt. 58.94	.37	.99	3.64	....
Cobalt (ic) Oxide C.P., Black, Powd. Co_2O_3 M.W. 165.94	.49	1.25	3.90	....
Cobalt (ic) Oxide, Tech., Black Powd.	....	....	2.67	2.61
Cobalt (ous) Acetate C.P., Cryst. $Co(CH_3COO)_2.4H_2O$ M.W. 249.10	.43	.96	2.96	2.91
Cobalt (ous) Acetate, Tech., Powd.	....	....	1.88	....
Cobalt (ous) Ammon. Sulphate C.P., Cryst. $CoSO_4.(NH)_{42}SO_4.6H_2O$ M.W. 395.09	....	.82	2.42	....
Cobalt (ous) Carbonate C.P., Powd. $CoCO_3.2CoO.4H_2O$ M.W. 340.98	....	1.82	5.85	....
Cobalt (ous) Chloride C.P., Cryst. $CoCl_2.6H_2O$ M.W. 237.99 25-lb. jar, **\$1.96 lb.**	.27	.79	2.41	2.35
Cobalt (ous) Chloride, Purified, Cryst.	.22	.54	1.86	1.81
Cobalt (ous) Chloride, Tech., Cryst.	....	....	1.60	1.56
Cobalt (ous) Chromate, Powd.	.47	1.42	4.45	....
Cobalt (ous) Nitrate C.P., Cryst. $Co(NO_3)_2.6H_2O$ M.W. 291.08	.27	.79	2.41	2.35
Cobalt (ous) Nitrate, Purified, Cryst.	.22	.53	1.82	1.77
Cobalt (ous) Nitrate, Tech., Cryst.	....	....	1.29	....
Cobalt (ous) Oxalate C.P., Powd. $CoC_2O_4.2H_2O$ M.W. 183.01	....	1.38	4.28	....
Cobalt (ous) Sulphate C.P., Cryst. $CoSO_4.7H_2O$ M.W. 281.14	.23	.68	2.03	1.96
Cobalt (ous) Sulphate, Tech., Cryst.	....	....	1.31	....
Cochineal Bugs, Natural	.18	.42	1.17	....
Cochineal, Powd.	.18	.40	1.30	....
Collodion U.S.P.	....	.20	.46	.35
Collodion, Flexible, U.S.P.	....	.29	.48	.38
Collodion, Cotton, Pyroxylin (Moistened with Denatured Alcohol)	....	....	1.40	....
Columbian Spirits—See Alcohol, Methyl.				
Congo Red, Powder	.23	.62	1.78	....
Copper Metal, Electrolytic, Foil, .002-inch thick Cu M.W. 63.57	.17	.26	.90	.85
Copper Metal, Electrolytic, Sheet, .008-inch thick	....	.26	.73	.68

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*Case and bottles \$5.50 extra and returnable.

**Carboy \$5.00 extra and returnable.

***Case and bottles included.

****Container extra and returnable.

	1 oz. Each	¼ lb. Each	1 lb. Each	5 lbs. Per lb.
Copper Metal, Granular	....	$ .20	$ .57	$ .53
Copper Metal, Precipitated Powd.	$ .30	.56	1.64	....
Copper Metal C.P., Shot	....	.34	.91	.86
Copper Metal, Shot	....	.20	.57	.52
Copper Metal, Turnings, Light	....	.23	.52	.48
Copper Metal, Turnings, Light, Degreased	....	....	.99	....
Copper Metal, Turnings, Heavy	....	.33	.90	.87
Copper Metal, Wire, No. 24	....	....	.66	....
Copper Carbonate, 54%, Bulk 10 lbs., **$ .26 lb.;** 100 lbs., **$ .24 lb.**	....	....	.30	.28
Copper Monochloride—See Cuprous Chloride.				
Copper Sulphate, Large or Small Cryst., Bulk $CuSO_4.5H_2O$ M.W. 249.71. 10 lbs., **$13.00 cwt.;** 25 lbs., **$11.00 cwt.;** 50 lbs., **$10.00 cwt.;** 100 lbs., **$9.00 cwt.;** 450-lb. bbl., **$7.50 cwt.**				
Copper Sulphate, Powdered—Add **$ .50 cwt.** to above prices.				
Copper, Salts of—See Cupric and Cuprous.				
Copperas—See Ferrous Sulphate.				
Coralline (Rosolic Acid)	.74	2.20	6.33	....
Corrosive Sublimate—See Mercuric Chloride.				
Cotton, Absorbent and Non-absorbent—See Page 112.				
Cream of Tartar—See Potassium Bitartrate.				
Cream Testing Acid—See Acid, Sulphuric.				
Creosote U.S.P. (From Wood Tar)	....	....	.88	....
Creosote, Beechwood, U.S.P.	.18	.39	1.27	....
Creosote, Carbonate U.S.P.	.26	.67	2.38	2.33
Creosote, Coal Tar, Regular Grade, Bulk 1-gal. can, **$ .70 gal.;** 5-gal. can, **$ .60 gal.;** 25-gal. drum, **$ .50 gal.;** 50-gal. drum, **$ .44 gal.**				
Creosote, Hardwood, Flotation Grade 1-gal. can, **$ .70 gal.;** 5-gal. can, **$ .60 gal.;** 50-gal. drum, **$ .45 gal.**				
Cresol U.S.P.	....	....	.46	.40
Cupferron (Ammonium Nitrosobetaphenylhydroxylamine) $C_6H_5.N.NO.ONH_4$ M.W. 155.13	1.24	3.90	....	....
Cupric Acetate C.P., Fine Cryst. ACS $Cu(CH_3COO)_2.H_2O$ M.W. 199.65	.30	.46	1.27	1.22
Cupric Acetate, Tech., Fine Cryst. (Verdigris)	....	....	.68	.62
Cupric Aceto Arsenite C.P., Powd. $(CuOAS_2O_3)_3.Cu(CH_3COO)_2$ M.W. 1014.11	....	.70	2.03	....
Cupric Ammonium Chloride C.P., Cryst. ACS $CuCl_2(NH_4Cl)_2.2H_2O$ M.W. 277.52	....	.40	1.12	1.07
Cupric Ammonium Sulphate C.P., Cryst. $4NH_3.CuSO_4.H_2O$ M.W. 245.77	....	.34	.94	....
Cupric Arsenate C.P., Powd.	....	.90	2.74	....
Cupric Arsenite	....	.48	1.64	1.57
Cupric Bichloride—See Cupric Chloride.				
Cupric Borate, Powd.	....	1.08	3.16	....
Cupric Bromide C.P., Cryst. $CuBr_2$ M.W. 223.41	.34	.75	2.08	1.89
Cupric Bromide, Cryst.	.29	.61	1.79	....
Cupric Carbonate C.P., Powd. (Basic) $CuCO_3Cu(OH)_2$ M.W. 221.16 25-lb. keg, **$1.13 lb.**	....	.51	1.48	1.43
Cupric Carbonate, Tech., Powd.	....	....	.46	.43
Cupric Chloride C.P., Cryst. $CuCl_2.2H_2O$ M.W. 170.52 25-lb. keg, **$ .69 lb.**	.23	.35	.96	.91
Cupric Chloride, Purified, Cryst. (Bichloride)	....	.21	.56	.51
Cupric Chloride C.P., Anhyd. Powd. $CuCl_2$ M.W. 134.49	....	.49	1.47	1.42
Cupric Nitrate C.P., Cryst. ACS $Cu(NO_3)_2.3H_2O$ M.W. 241.63 25-lb. keg, **$ .67 lb.**	.25	.35	.94	.88
Cupric Nitrate, Purified, Cryst.	....	.37	.81	.75
Cupric Nitrate, Tech., Gran.	....	....	.59	.53
Cupric Oleate, Tech. $Cu(C_{18}H_{33}O_2)_2$ M.W. 626.28	....	....	.85	....
Cupric Oxalate C.P., Powd. $CuC_2O_4.\frac{1}{2}H_2O$ M.W. 160.59	....	.98	3.07	....
Cupric Oxide C.P., Black Powd. ACS CuO M.W. 79.57	.33	.59	1.72	1.66
Cupric Oxide, Purified, Black Powd.	....	.38	1.21	1.16
Cupric Oxide, Tech., Black Powd.	....	.21	.56	.51
Cupric Oxide C.P., Wire ACS	.36	.62	1.85	1.79
Cupric Oxide, Tech., Wire	....	.38	1.24	....
Cupric Phosphate C.P., Powd. $Cu_3(PO_4)_2.3H_2O$ M.W. 434.84	....	.81	2.48	....
Cupric Potassium Chloride C.P., Cryst. $CuCl_2.2KCl.2H_2O$ M.W. 319.64	....	....	.95	.90
Cupric Potassium Sulphate C.P., Cryst. $CuSO_4K_2SO_4.6H_2O$ M.W. 442.12	....	....	1.91	....
Cupric Subcarbonate—See Cupric Carbonate.				
Cupric Sulphate C.P., Large Cryst. ACS $CuSO_4.5H_2O$ M.W. 249.71 25-lb. keg, **$ .35 lb.**	....	.23	.57	.52
Cupric Sulphate C.P., Fine Cryst. 25-lb. keg, **$ .39 lb.**	....	.26	.62	.57
Cupric Sulphate C.P., Anhyd., Powd. $CuSO_4$ M.W. 159.62	.16	.39	1.07	1.01
Cupric Sulphate U.S.P., Cryst.	....	.21	.48	.46
Cupric Sulphate U.S.P., Powd.	....	.22	.52	.49
Cupric Sulphate, Pure, Anhyd., Powd.	....	.30	.91	.86
Cupric Sulphate, Tech., Cryst.—See Copper Sulphate.				
Cupric Sulphide C.P., (Prec.), Powd. CuS M.W. 95.63	.34	.55	1.60	1.55
Cupric Tartrate C.P., Powd. $CuC_4H_4O_6$ M.W. 211.62	....	.81	2.48	....
Cuprous Bromide C.P., Powd. $CuBr$ M.W. 143.50	.30	.88	2.74	....
Cuprous Chloride C.P., Powd. (Copper Monochloride) ACS $CuCl$ M.W. 99.03 25-lb. jar, **$1.02 lb.**	....	.47	1.34	1.29
Cuprous Chloride, Tech.	....	....	1.07	1.01
Cuprous Cyanide C.P., Powd. $CuCN$ M.W. 89.59	....	.86	2.60	....

*Case and bottles $5.50 extra and returnable.

**Carboy $5.00 extra and returnable.

***Case and bottles included.

****Container extra and returnable.

	1 oz. Each	¼ lb. Each	1 lb. Each	5 lbs. Per lb.
Cuprous Cyanide, Purified, Powd. $CuCN$ M.W. 89.59	....	....	$ .75	....
Cuprous Oxide C.P., Red Powder Cu_2O M.W. 143.14	$ .29	$ .38	1.04	$ .99
Cuprous Oxide, Tech., Red Powd.	....	....	.61	.55
Cyanogas "A", Dust 6 1-lb. cartons (1 case), **$ .50 lb.**	....	....	.75	....
Cyanide-Chloride Mixture, Tech., 73-76%, (Fine Gran.)	....	....	.59	.42
Cylcap, Cement Cylinder Capping Compound 100-lb. bag, **$4.00 cwt.**				
Darko (Activated Charcoal) 10-lb. ctn., **$21.00 cwt.;** 5x10-lb ctn., **$18.00 cwt.** 1000 lbs., **$15.00 cwt.**				
Dessichlora (Barium Perchlorate Anhyd.-Smith)	....	....	2.00	1.77
Devarda's Alloy—See Metal, Devarda's.				
Dextrin, NF, White Powd.	....	....	.27	.25
Dextrine, Yellow, Bulk	....	....	.25	....
10 lbs., **$ .15 lb.;** 25 lbs., **$ .13 lb.;** 50 lbs., **$ .11 lb.;** 140-lb. bags, **$ .10 lb.**				
Dextrose C.P., Cryst. $C_6H_{12}O_6.H_2O$ M.W. 198.15 25-lb. keg, **$ .68 lb.**	.25	.35	.95	.90
Dextrose C.P., Anhyd., Powd. $C_6H_{12}O_6$ M.W. 180.13 25-lb. keg, **$ .39 lb.**	.16	.28	.62	.57
Dextrose U.S.P., Gran.	....	.16	.44	.38
Dextrose, Tech., Granular (Grape Sugar)	....	.14	.26	.22
Dextrose, Tech., Syrup (Glucose)	....	....	.36	.31
Diamond Ink—For permanent writing on glass	.45	1.00	....	....
Dimethyl Aniline, Purified, Liquid	.21	.33	.85	.78
Dimethyl Benzene—See Xylene.				
Dimethyl Glyoxime C.P., Powd.	.52	1.70	5.43	....
Dimethyl Ketone—See Acetone.				
Dimethyl Sulphate, Liquid	....	....	.85	....
Dinitroamidophenol—See Acid, Picramic.				
Dioxan (Diethylene Oxide 1.4)	....	.25	.60	.55
Diphenylamine, Purified $(C_6H_5)_2NH$ M.W. 169.16	.26	.35	1.12	....
Drierite (Anhyd. Calcium Sulphate) 4-8 Mesh	....	....	.75	.67
Drierite, Special Indicating, 4-8 Mesh ½-lb. bottle, **$1.15 ea.**	....	....	1.95	1.80
Egg Preserver—See Sodium Silicate.				
Electrolyte—See Acid Sulphuric (Battery Acid).				
Elon—See Pictol.				
Epsom Salts—See Magnesium Sulphate.				
Eschka's Mixture C.P. 25-lb. can, **$2.15 lb.**	....	.87	2.67	2.61
Ether Acetic—See Ethyl Acetate.				
Ether, Anhydrous, C.P., ACS (Distilled over Sodium) (Ether Dehydrated) (Anhydrous Ether) $(C_2H_5)_2O$ M.W. 74.08 27-lb. drum, **$ .46 lb.**	....	.27	.74	.69
Ether C.P., ACS 27-lb. drum, **$ .40 lb.**	....	.27	.61	.56
Ether, Washed	....	....	.55	.49
Ether, Purified (Formerly Labeled U.S.P.) ½-lb. can, **$ .57 lb.**	....	.20	.44	.36
Ether, Purified (Dried For Fat Extraction)	....	....	.56	.49
Ether, For Anesthesia ½-lb. can, **$ .66 lb.**	....	.21	.53	.46
Ether, Concentrated, Bulk (5½ lbs. per gal.) 1-gal. can, **$ .32 lb.;** 5-gal. can, **$ .25 lb.;** 55-lb. drum, **$ .22 lb.**	....	....	.40	....
Ether, Petroleum C.P. (Benzine) (BP 35° to 60° C) 27-lb. drum, **$ .29 lb.**	....	....	.53	.47
Ether, Petroleum C.P., Special (Benzine) (BP 20° to 40° C)	....	....	.79	.74
Ethyl Acetate C.P., Absolute $CH_3COO.C_2H_5$ M.W. 88.06	.21	.25	.60	.55
Ethyl Acetate, N.F. (Ether Acetic)	....	....	.35	.31
Ethyl Bromide, Purified, (Ether Hydrobromic) C_2H_5Br M.W. 108.97	.22	.38	1.25	1.20
Ethyl Butyrate, Tech., Absolute $CH_3.CH_2.CH_2.COO.C_2H_5$ M.W. 116.13	....	.40	1.30	....
Ethyl Formate (Ether Formic) $HCOO.C_2H_5$ M.W. 74.06	....	.31	.95	.90
Ethyl Iodide, Purified C_2H_5I M.W. 155.97	.57	1.76	6.45	....
Ethylene Bromide $CH_2Br.CH_2Br$ M.W. 187.88	.20	.42	1.40	1.35
Ethylene Dichloride, Bulk (10.6 lb. per gal.) $CH_2Cl.CH_2Cl$ M.W. 98.96 1-gal. can, **$1.75 gal.;** 5-gal. can, **$1.50 gal.;** 10-gal. can, **$1.40 gal.;** 500-lb. drum, **$8.00 cwt.**				
Ethylene Glycol, Pure $CH_2OH.CH_2OH$ M.W. 62.06	....	.31	.72	.65
Ethylic Ether—See Ether U.S.P.				
Eucalyptol U.S.P.	.17	.33	1.01	.96
Ferric Acetate C.P., Dry $FeOH(CH_2COOH)_2$ M.W. 190.92	....	.48	1.39	1.33
Ferric Acetate, Sol. (Sp. Gr. 1.10 to 25° C)	....	....	1.20	....
Ferric Alum—See Ferric Ammonium Sulphate.				
Ferric Ammonium Chloride C.P., Fine Cryst.	....	.53	1.46	1.40
Ferric Ammonium Citrate U.S.P., Brown Scales	....	....	.83	.74
Ferric Ammonium Citrate U.S.P., Brown Powd.	....	....	.78	.69
Ferric Ammonium Citrate U.S.P., Green Scales	....	....	.83	.74
Ferric Ammonium Oxalate C.P., Cryst. $Fe(NH)(CO).3H_2O$ M.W. 428.01	....	.42	1.16	....
Ferric Ammonium Sulphate C.P., Cryst. ACS $Fe_2(SO_4)_3.(NH_4)_2SO_4.24H_2O$ M.W. 964.40	....	.23	.60	.55
Ferric Ammonium Sulphate U.S.P., Cryst. (Alum Ferric)	....	....	.47	.42
Ferric Chloride C.P., Lump ACS $FeCl_3.6H_2O$ M.W. 270.31 25-lb. jar, **$ .32 lb.**	....	.22	.52	.47
Ferric Chloride C.P., Special, Lump, ACS, (Low in Phos.)	....	.33	.83	.78
Ferric Chloride U.S.P., Lump	....	.20	.35	.30

*Case and bottles $5.50 extra and returnable.
***Case and bottles included.

**Carboy $5.00 extra and returnable.
****Container extra and returnable.

	1 oz. Each	¼ lb. Each	1 lb. Each	5 lbs. Per lb.
Ferric Chloride, (Iron Chloride), Lumps, Photo, Bulk. 10 lb., **$ .14 lb.;** 25 lb., **$ .13 lb.;** 50 lb., **$ .12 lb.;** 100-lb. keg, **$ .11 lb.;** 500-lb. bbl., **$ .10 lb.**	....	....	$ .16	$ .15
Ferric Citrate U.S.P., Scales	....	....	1.24	1.14
Ferric Citrate U.S.P., Powd.	$ .20	$ .41	1.33	1.24
Ferric Ferrocyanide, Soluble	.16	.25	.81	.78
Ferric Ferroso Oxide, Powd. (Magnetic Oxide of Iron)	....	....	.47	....
Ferric Hydroxide C.P., Moist $Fe(OH)_3$ M.W. 106.86	....	.34	.94	....
Ferric Hydroxide, Dry	....	.33	1.01	.95
Ferric Hypophosphite, NF $Fe(H_2PO_2)_3$ M.W. 251.01	.26	.66	2.34	2.28
Ferric Nitrate C.P., Cryst. ACS $Fe(NO)_3.9H_2O$ M.W. 404.01	.34	.46	1.11	.91
Ferric Oxalate, Pearls $Fe_2(C_2O_4)_3.6H_2O$ M.W. 483.81	....	.40	1.29	1.18
Ferric Oxide C.P., Powd. Fe_2O_3 M.W. 159.68 25-lb. keg, **$ .43 lb.**	.22	.26	.66	.61
Ferric Oxide, Powd.	....	.18	.26	....
Ferric Oxide, Red	....	....	.20	.18
Ferric Oxide, Saccharated, NF	....	....	.66	.59
Ferric Phosphate C.P., Powd. $Fe\ PO_4\ .4H_2O$ M.W. 222.94	.34	1.04	3.25	....
Ferric Phosphate, NF, Scales (Soluble)	....	....	.99	.90
Ferric Potassium Oxalate $K_3Fe(C_2O_4)_3+3H_2O$ M.W. 491.22	....	.28	.83	.78
Ferric Potassium Tartrate, Pearls $K(FeO)C_4H_4O_6$ M.W. 258.99	.20	.41	1.40	1.37
Ferric Succinate	.33	.93	3.42	3.35
Ferric Sulphate C.P., Powd. $Fe_2(SO_4)_3.H_2O$	....	.33	.85	.79
Ferric Sulphate, Purified, Basic (Monsel's Salt)	....	.22	.57	....
Ferric Valerate, Powd. $Fe(C_5H_9O_2)(OH)_2$ M.W. 190.95	.46	1.44	5.46	5.40
Ferrous Ammonium Sulphate C.P., Fine Cryst. $FeSO_4.(NH_4)_2SO_4.6H_2O$ M.W. 392.14 25-lb. keg, **$ .35 lb.**	....	.23	.57	.52
Ferrous Ammonium Sulphate C.P., Special, Fine Cryst., ACS (Low in Mn)	.27	.40	1.09	1.04
Ferrous Ammonium Sulphate, Purified, Cryst.	....	....	.44	.39
Ferrous Bromide $FeBr_2$ M.W. 215.68	.30	.53	1.57	1.39
Ferrous Chloride C.P., Cryst. $FeCl_2.4H_2O$ M.W. 198.82	....	.34	.91	.86
Ferrous Iodide, Lumps FeI_2 M.W. 309.68	.46	1.15	4.07	3.88
Ferrous Oxalate, Purified, Powd. $FeC_2O_4.2H_2O$ M.W. 179.88	....	....	.91	.83
Ferrous Phosphate C.P., Powd. $Fe_3(PO_4)_2.8H_2O$ M.W. 501.73	....	.61	1.84	....
Ferrous Sulphate C.P., Fine Cryst. $FeSO_4.7H_2O$ M.W. 278.02 25-lb. keg, **$ .37 lb.**	.18	.23	.56	.51
Ferrous Sulphate C.P., Spec., Fine Cryst., (Low in Mn)	....	.36	1.00	.95
Ferrous Sulphate C.P., Dried, Powd. $FeSO_4$ M.W. 151.01	....	.34	.96	.92
Ferrous Sulphate U.S.P., Cryst. 25-lb. can, **$ .18 lb.**	....	....	.27	.23
Ferrous Sulphate U.S.P., Granular	....	....	.35	.31
Ferrous Sulphate U.S.P., Exsic	....	....	.31	....
Ferrous Sulphate, Tech. (Copperas)	....	....	.14	.10
Ferrous Sulphide, Lump FeS M.W. 87.90	....	....	.21	.18
Ferrous Sulphide, Gran.	....	....	.23	.21
Ferrous Sulphide, Sticks	....	....	.26	.23
Fire Clay, Ground 10 lb., **$ .03 lb.;** 25 lb., **$ .02 lb.;** 50 lb., **$ .01½ lb.;** 100-lb. bag, **$1.00 cwt.;** 1000-lb. bag, **$ .80 cwt.;** 2000 lb., **$ .60 cwt.**				
Fire Extinguisher Liquid—See Carbon Tetrachloride, also see page 159.				
Fixanal Solutions—See page 436.				
Flotation Reagents—See under name, as: Barret Reagent, Pine Oil, xanthate, etc.				
Fluorescein, Water Soluble, For water pollution work	.50	1.60	6.00	....
Fluorspar—See Calcium Fluoride.				
Flux, Lead, For assaying (Use 32½ grams to 10 grams ore, use salt cover). 10 lbs., **$ .10 lb.;** 25 lbs., **$ .09 lb.;** 100 lbs., **$ .08 lb.**				
Flux, Richards, For assaying gold ores (Use 60 grams to ¼ AT charge, cover with 5 grams powd. Borax, use nails according to Sulphur content) 10 lbs., **$ .18 lb.;** 25 lbs., **$ .16 lb.;** 100 lbs., **$ .15 lb.**				
Formaldehyde C.P. HCHO M.W. 30.02	....	....	.49	.44
Formaldehyde, 40%, Sol. U.S.P., Bulk, (37% by weight, 40% by volume) (8.2 lb. per gal.) 1 gal., **$1.55 gal.;** 5 gals., **$1.40 gal.;** 125-lb. keg, **$11.00 cwt.;** 450-lb. bbl., **$9.50 cwt.**	....	....	.30	.25
Fullers Earth—See Kaolin.				
Fullers Earth, 16-30 Mesh, 30-60 Mesh, 200 Mesh (Specify which) 1 to 9 lbs., **$ .10 lb.;** 10 lbs., **$ .08 lb.;** 25 lbs., **$ .07 lb.;** 50 lbs., **$ .06 lb.;** 100 lbs., **$ .05 lb.**				
Furfural, Purified	....	.27	.78	.73
Fusel Oil—See Alcohol Amylic.				
Galena—See Lead Sulphide, Native.				
Gases, Laboratory—See page 191.				
Gelatin, Powd.	....	.39	.83	.81
Glass Wool Medium, (Lead Free)	.18	.42	1.51	....
Glass Wool Fine, (Lead Free)	.21	.57	1.77	....
Glauber's Salt—See Sodium Sulphate Cryst.				
Glucose Syrup—See Dextrose.				
Glycerine C.P. (Glycerol) $C_3H_5(OH)_3$ M.W. 92.06 25-lb. can, **$ .56 lb.**	....	.27	.64	.59
Glycerine, "C.P.-U.S.P.," Bulk, (10.5 lb. per gal.) 1 pt., **$ .50 pt.;** 1 qt., **$ .95 qt.** 1 gal., **$2.85 gal.;** 5 gal., **$2.50 gal.;** 550-lb. drum, **$20.00 cwt.********				
Glycerine U.S.P. (Glycerol) 25-lb. can, **$ .26 lb.;** 50-lb. can, **$ .24 lb.**	....	....	.42	.35

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*Case and bottles $5.50 extra and returnable.

**Carboy $5.00 extra and returnable.

***Case and bottles included.

****Container extra and returnable.

	1 oz. Each	¼ lb. Each	1 lb. Each	5 lbs. Per lb.
Gold Chloride, Purified $AuCl_3.HCl+3H_2O$ M.W. 394.10 15 grains, **$1.10 grain** ⅛-oz. gsb., **$3.21 lot;** 1-oz. gsb., **$25.00 oz.**				
Gold Leaf, Per book, **$1.50.**				
Crape Sugar—See Dextrose, Tech. Granular.				
Graphite, Tech., Powd.	....	$ .25	$ .48	....
Guaiacol U.S.P., Liquid	$ .27	.71	2.54	....
Guaiacol Carbonate NF $(C_6H_4OCH_3O)_2CO$ M.W. 274.19	.29	.89	3.39	....
Gum Arabic, Coarse (Pea Size)	....	....	.49	....
Gum Arabic, White Powder	....	....	.32	$ .29
Gum Ghatti, Soluble	....	....	.52	.45
Gum Guaiac (For Occult Blood)	.26	.43	1.40	....
Gum Mastic	.22	.40	1.38	....
Gum Tragacanth	.26	.52	1.73	....
Gypsum, Lump or Powd.	....	....	.30	.25
Herman Inquarts—See Page 229.				
Hide Powder, For Standardizing (Tea's Amer. Standard)	....	....	3.74	....
Horne's Dry Lead, For Sugar Analysis 10-lb. bottle, **$ .52 lb.**	....	....	.59	.54
HTH—See Perchloron.				
Hydralo (Alumina) (Laboratory Desiccant)	....		1.00	....
Hydrazine Sulphate C.P., Powd. $(NH_2)_2H_2SO_4$ M.W. 130.12	1.11	....	....	....
Hydrochinone—See Hydroquinone.				
Hydrogen Iodide—See Acid, Hydriodic.				
Hydrogen Peroxide C.P., 3% Sol., (Hydrogen Dioxide Solution) H_2O_2 M.W. 34.02 25-lb. demj., **$ .25 lb.******	....	.25	.42	.36
Hydrogen Peroxide C.P., 30% Sol.	.43	.98	2.60	....
Hydrogen Peroxide 30% 1-gal. jug, **$4.50 gal.**	....	....	1.52	1.33
Hydrogen Peroxide C.P., Special 30% Sol. ACS	.48	1.34	3.90	....
Hydrogen Peroxide, Marchand's	....	....	.91	....
Hydrogen Peroxide U.S.P., 3%	....	....	.23	.18
Hydroquinone C.P. $C_6H_4(OH)_2(1:4)$ M.W. 110.08	.20	.47	.65	1.60
8-Hydroxyquinoline C.P., Cryst.	2.00	4.00	....	....
Hydroxylamine Hydrochloride C.P. $NH_2OH.HCl$ M.W. 69.50	.70	2.34	7.54	....
Hydroxylamine Sulphate C.P., Cryst. $(NH_2OH)_2.H_2SO_4$ M.W. 164.14	.60	3.43	11.05	....
Hytempite—See Page 333.				
Iceland Spar (For Standardizing) $CaCO_3$ M.W. 100.08	.37	.94	2.86	....
Iceland Spar, Tech., Lump	....	.52	1.50	....
Indigo Carmine, Dry	.23	.58	2.02	....
Infusorial Earth, Powd.	....	....	.18	.17
Inquarts, Herman—See Page 229.				
Insecticides—Write for folder.				
Iodine C.P., Resublimed ACS I At. Wt., 126.92	.49	1.27	3.84	3.64
Iodine U.S.P., Resublimed	.39	.81	2.67	2.41
Iodine, Crude	....	....	1.85	1.66
Iodine Pentoxide—See Acid Iodic Anhyd.				
Iodoform U.S.P., Light Powd. CHI_3 M.W. 393.77 ⅛-oz. bottle, **$ .96 oz.**	.46	1.44	5.46	5.41
Iron, Salts of—See Ferric and Ferrous.				
Iron Filings, 20 Mesh, Degreased (Cast Iron)	....	....	.36	.34
Iron Filings, 20 Mesh	....	....	.29	.25
Iron Filings, 40 Mesh Degreased (Cast Iron)	....	....	.36	.34
Iron Filings, 40 Mesh	....	....	.29	.25
Iron Oxide—See Ferric Oxide.				
Iron Perchloride—See Ferric Chloride.				
Iron Powder C.P. (By Hydrogen) (Low in Nitrogen)	.33	.65	1.91	....
Iron Powder U.S.P. (By Hydrogen)	.20	.41	1.34	1.27
Iron Powder 100 Mesh	....	....	.27	.25
Iron Protochloride—See Ferrous Chloride.				
Iron Pyrites FeS_2 M.W. 119.96	....	....	.21	.17
Iron Sulphate, Com'l., Gran., Bulk (Copperas) 25 lb., **$6.00 cwt.;** 50 lb., **$5.00 cwt.;** 100 lb., **$4.00 cwt.;** 1000 lbs., **$3.00 cwt.**				
Iron Sulphide—See Ferrous Sulphide.				
Iron Tersulphate—See Ferric Sulphate.				
Iron Wire No. 36 (For Standardizing) 1-oz. spools, **$ .39 ea.;** ¼-lb. spools, **$ .59 ea.;** ½-lb. spools, **$ .85 ea.;** 1-lb. spools, **$1.30 ea.**				
Jack Bean Meal	.21	.42	1.25	....
Kaolin, Washed,-Powd. (American Standard)	....	....	.68	.61
Kaolin, Washed and Ignited, Powd.	....	....	1.04	.98
Kaolin, NF, Powd.	....	....	.23	.21
Kieselguhr—See Infusorial Earth.				
Lacmoid (Indicator)	1.43	5.20	....	....
Lactose C.P., Cryst. $C_{12}H_{22}O_{11}.H_2O$ M.W. 360.19	....	.62	1.82	1.77
Lactose C.P., Powd.	....	.29	.72	....

*Case and bottles $5.50 extra and returnable.
***Case and bottles included.

**Carboy $5.00 extra and returnable.
****Container extra and returnable.

	1 oz. Each	¼ lb. Each	1 lb. Each	5 lbs. Per lb.
Lactose U.S.P., Powd. (Milk Sugar)	....	....	$ .40	$ .35
Lanolin Anhyd. U.S.P. (Adeps Lanae, Wool Fat)	....	....	.40	.38
Lanolin Hydrous U.S.P.	....	....	.36	.34
Lead Metal C.P., Gran. Pb At. Wt. 207.22	....	$ .22	.52	.47
Lead Metal, Test Lead, C.P. Gran. (Free from Au, Ag, and Bi) (For Assaying) 10-lb. ctn., $ **.21 lb.;** 25-lb. bag, $ **.16 lb.;** 50-lb. bag, $ **.15 lb.;** 100-lb. can, **$14.50 cwt.**	....	....	.25	.23
Lead Metal Foil, Assay Grade 10 lbs., $ **.30 lb.;** 25 lbs., $ **.28 lb.;** 50 lbs., $ **.26 lb.** 100 lbs., $ **.24 lb.**	....	....	.35	.31
Lead Metal Foil C.P., Special For Assaying 10 lbs., $ **.39 lb.;** 25 lbs., $ **.37 lb.;** 50 lbs., $ **.35 lb.;** 100 lbs., $ **.33 lb.**	....	....	.45	.41
Lead Metal, Sticks (Ag. Free)	....	....	.82	....
Lead Metal, Com'l., Mossy or Shot	....	....	.30	.27
Lead Acetate C.P., Cryst. ACS (Neutral) $Pb(CH_3COO)_2.3H_2O$ M.W. 379.30 25-lb. keg, $ **.37 lb.**	....	.25	.60	.55
Lead Acetate C.P., Basic, Primary Powd. ACS	....	.40	1.12	....
Lead Acetate C.P., Basic, Dry, Powd. (For Sugar Analysis) 25-lb. can, $ **.37 lb.**	....	.25	.60	.55
Lead Acetate U.S.P., Cryst.	....	....	.43	.40
Lead Acetate U.S.P., Granular	....	.22	.43	.40
Lead Acetate U.S.P., Powd.	....	....	.43	.40
Lead Acetate, White, Gran. Bulk 10 lbs., $ **.24 lb.;** 25 lbs., $ **.22 lb.;** 50 lbs., $ **.20 lb.;** 100 lbs., $ **.19 lb.;** 500-lb. bbl., $ **.18 lb.**	....	....	....	.26
Lead Arsenate C.P., Powd. $PbHAs_2O_4$ M.W. 347.16	....	.65	1.94	....
Lead Arsenate, Pure	....	.26	.73	.66
Lead Arsenate, Std., Powd. (Insecticide) 100-lb. drum, $ **.15 lb.;** 50-lb. case (10 5-lb. bags), $ **.15 lb.;** 48-lb. case (12 4-lb. bags), $ **.15 lb.;** 48-lb. case (8 6-lb. bags), $ **.15 lb.;** 50-lb. case (50 1-lb. bags), $ **.21 lb.**				
Lead Borate C.P., Powd. $Pb(BO_2)_2.H_2O$ M.W. 311.02	....	.68	2.00	....
Lead Carbonate C.P., Basic, Powd. $2PbCO_3Pb(OH)_2$ M.W. 775.62	....	.35	.95	.90
Lead Carbonate, Purified, Basic, Powd. (White Lead)	....	.23	.36	.34
Lead Chloride C.P., Powd. $PbCl_2$ M.W. 278.11	....	.38	1.04	.99
Lead Chloride, Purified, Powd.	....	....	.79	.75
Lead Chromate C.P., Powd. $PbCrO_4$ M.W. 323.21	....	.38	1.03	.98
Lead Chromate C.P., Ignited Powd., ACS	....	.65	1.95	....
Lead Dioxide—See Lead Peroxide.				
Lead Iodide C.P., Powd. PbI_2 M.W. 461.04	$ .51	1.63	5.23	....
Lead Monoxide—See Lead Oxide, Litharge.				
Lead Nitrate C.P., Cryst. ACS $Pb(NO_3)_2$ M.W. 331.22 25-lb. keg, $ **.56 lb.**	....	.31	.82	.77
Lead Nitrate, 99-100%, Purified, Cryst.	....	.22	.60	.55
Lead Nitrate, Cryst., Bulk 10 lbs., $ **.20 lb.;** 25 lbs., $ **.18 lb.;** 50 lbs., $ **.17 lb.;** 100 lbs., $ **.16 lb.;** 600-lb. bbl., $ **.14 lb.**	....	....	....	.22
Lead Oxalate C.P., Powd. PbC_2O_4 M.W. 295.21	....	....	1.91	....
Lead Oxide C.P., (Litharge), Powd., (Reagent Grade) PbO M.W. 223.20 25-lb. keg, $ **.35 lb.**	....	.23	.57	.52
Lead Oxide, Yellow, NF (Litharge)	....	....	.36	.34
Lead Oxide C.P., Powd. (Red Lead) Pb_3O_4 M.W. 685.60 25-lb. keg, $ **.30 lb.**	....	....	.52	.47
Lead Oxide, NF, (Red Lead)	....	....	.38	.35
Lead Oxide, Assayers—See Litharge.				
Lead Peroxide C.P., Powd. ACS (Lead Dioxide) PbO_2 M.W. 239.20 25-lb. keg, $ **.87 lb.**	.29	.43	1.20	1.14
Lead Peroxide, Tech., 90%, Powd., (Lead Dioxide)	....	....	.68	.62
Lead Phosphate C.P., Powd. $Pb_3(PO_4)_2$ M.W. 811.68	....	.65	1.95	....
Lead Subacetate—See Lead Acetate, Basic.				
Lead Subcarbonate—See Lead Carbonate.				
Lead Sulphate C.P., Powd. $PbSO_4$ M.W. 303.26	.25	.36	1.01	....
Lead Sulphate, Purified	....	.26	.75	.70
Lead Sulphide C.P., Powd. PbS M.W. 239.17	....	.62	1.87	1.83
Lead Sulphide, Artificial, Powd.	.36	.81	2.43	....
Lead Sulphide, Native, Lump (Galena)	....	....	.39	.35
Lead Tartrate C.P., Powd. $PbC_4H_4O_6$ M.W. 355.25	....	.66	1.98	....
Lime, Hydrated, Flotation Grade (In 50-lb. sacks) 1 to 4 sacks, **$1.00 sack;** 5 to 9 sacks, $ **.85 sack;** 10 sacks and over, $ **.65 sack.**				
Lime, Sulphurated—See Calcium Sulphide.				
Litharge C.P. Pueblo Brand, Assayers Grade (Free from Au, Ag, and Bi) PbO M.W. 223.20 10-lb. ctn., $ **.19 lb.;** 25-lb. bag, $ **.16 lb.;** 50-lb. bag, $ **.15 lb.;** 100-lb. can, $ **.14½ lb.;** 500 lbs., $ **.13½ lb.;** 2000 lbs., $ **.13 lb.;**				
Litharge, Com'l., Bulk, Regular Grade 10 lbs., $ **.15 lb.;** 25 lbs., **$12.50 cwt.;** 50 lbs., **$11.50 cwt.;** 100 lbs., **$10.50 cwt.;** 500-lb. drum, **$9.00 cwt.**				
Litharge, Com'l., Bulk, Sublimed Grade (For Oil Refineries) 600-lb. drum, **$9.00 cwt.**				
Litharge, Reagent Grades—See Lead Oxide.				
Lithium Acetate $LiC_2H_3O_2+2H_2O$ M.W. 102.01	.31	.88	3.22	3.17
Lithium Bitartrate $LiC_4H_5O_6+H_2O$ M.W. 174,02	.23	.57	1.99	1.94
Lithium Bromide, NF LiBr M.W. 86.86	.40	.88	2.96	2.77
Lithium Carbonate C.P., Powd. Li_2CO_3 M.W. 73.88 25-lb. keg, **$2.07 lb.**	.29	.85	2.57	2.52
Lithium Carbonate, NF	.23	.58	2.02	1.96
Lithium Chloride C.P. LiCl M.W. 42.40	.34	1.03	3.19	3.13

*Case and bottles $5.50 extra and returnable.
***Case and bottles included.

**Carboy $5.00 extra and returnable.
****Container extra and returnable.

	1 oz. Each	¼ lb. Each	1 lb. Each	5 lbs. Per lb.
Lithium Chloride, Purified	$ .29	$ .68	$2.44	$2.39
Lithium Citrate, NF, Gran. or Powd. $C_3H_4OH(COOLi)_3.4H_2O$ M.W. 281.95	.25	.61	2.15	2.09
Lithium Fluoride C.P., Powd. LiF M.W. 25.94	....	1.63	5.16	5.11
Lithium Iodide $LiI+3H_2O$ M.W. 187.91	.69	1.95	7.21	....
Lithium Nitrate C.P., Cryst. $LiNO_3$ M.W. 68.95	.30	.92	2.83	2.78
Lithium Nitrate, Purified, Cryst.	.29	.70	2.51	2.40
Lithium Phosphate $2Li_3PO_4+H_2O$ M.W. 249.74	.34	1.01	3.74	3.69
Lithium Sulphate C.P., Gran. $LiSO_4.H_2O$ M.W. 127.96	.29	.85	2.57	2.52
Lithium Tartrate $Li_2C_4H_4O_6+H_2O$ M.W. 179.95	.32	.92	3.37	3.32
Litmus Cubes	.18	.38	1.24	1.17
Litmus Powder	.23	.42	1.38	....
Liver of Sulphur—See Potassium Sulphide (Sulphuret).				
Logwood Chips	....	.23	.42	....
Lunar Caustic U.S.P. (Silver Nitrate Fused) 4-oz. bottle, **$ .64 oz.; 16-oz. bottle, $ .62 oz.**	.71	....	....	....
Magnesia—See Magnesium Oxide.				
Magnesite, Dead Burnt, Tech., Powd.	....	....	.35	.30
Magnesite, Tech., Lump	....	....	.26	.21
Magnesium Metal, Powd. Mg. At. Wt. 24.32	.30	.86	3.22	3.18
Magnesium Metal, Turnings, 99.8% (For Grignards Reaction)	....	.40	1.44	1.31
Magnesium Metal, Ribbon, .006 inches x .125 inches 1-oz. paper	.36	....	....	....
Magnesium Acetate C.P., Cryst. $Mg(CH_3COO)_2.4H_2O$ M.W. 214.45	....	.56	1.63	1.57
Magnesium Ammonium Chloride, Cryst., $MgCl_2.NH_4Cl.6H_2O$ M.W. 256.84	....	.37	1.02	.97
Magnesium Bromide C.P., Cryst. $MgBr_2.6H_2O$ M.W. 292.25	....	.72	2.17	....
Magnesium Carbonate C.P., Powd.	....	.43	1.17	1.12
Magnesium Carbonate C.P., Special, Powd. (Low in Chloride)	....	.69	2.00	....
Magnesium Carbonate U.S.P., Heavy ,Powd.	....	....	.38	.35
Magnesium Carbonate U.S.P., Light, Powd.	....	....	.39	.35
Magnesium Carbonate, (Powdered Magnesia), Bulk 10 lbs., **$ .20 lb.; 25 lbs., $ .18 lb.; 50 lbs., $ .17 lb.**				
Magnesium Chloride C.P., Cryst. $MgCl_2.6H_2O$ M.W. 203.33	....	.26	.65	.60
Magnesium Chloride C.P., Spec., Cryst. ACS (Low in Alk. Salts)	....	.34	.87	.82
Magnesium Chloride C.P., Lump, Fused $MgCl_2+H_2O$	....	.55	1.59	....
Magnesium Chloride, NF, Cryst.	....	....	.47	.42
Magnesium Chloride, Tech.	....	....	.26	.20
Magnesium Chromate C.P., Powd. $MgCrO_4.3H_2O$ M.W. 194.36	.42	1.26	3.86	....
Magnesium Citrate C.P., Powd. $Mg_3(C_6H_5O_7)_2+14H_2O$ M.W. 703.32	.33	.91	2.77	....
Magnesium Citrate, Soluble, Powd.	.21	.45	1.50	1.44
Magnesium Fluoride C.P., Powd. MgF_2 M.W. 62.32	....	1.13	3.50	....
Magnesium Hypophosphite $Mg(H_4PO_2)_2+6H_2O$ M.W. 262.53	.25	.63	2.21	2.15
Magnesium Nitrate C.P., Cryst. $Mg(NO_3)_2.6H_2O$ M.W. 253.43 25-lb. keg, **$ .48 lb.**	....	.29	.73	.68
Magnesium Nitrate, Recryst.	....	....	.53	.48
Magnesium Nitrate C.P., Fused, Lump $Mg(NO_3)_2$	....	....	1.55	....
Magnesium Nitrate, Tech., Cryst.	....	....	.39	....
Magnesium Oxalate C.P., Powd. $MgC_2O_4.2H_2O$ M.W. 148.36	....	.75	2.20	....
Magnesium Oxide C.P., Powd. MgO M.W. 40.32	.29	.83	2.56	....
Magnesium Oxide C.P., Special Cryst. ACS	....	1.17	3.64	....
Magnesium Oxide U.S.P., Light Powd.	....	.29	.75	.68
Magnesium Oxide U.S.P., Heavy Powd.	....	....	.68	.64
Magnesium Oxide, Tech.—See Magnesite, Dead Burnt.				
Magnesium Oxide C.P. and Sodium Carbonate C.P.—See Eschka's Mixture.				
Magnesium Peroxide, Purified, Powd.	....	.65	2.28	1.95
Magnesium Phosphate, Secondary, Powd. (Dibasic) $MgHPO_4.3H_2O$ M.W. 174.42	....	.22	.66	.64
Magnesium Phosphate, C.P., Tertiary Powd. $Mg_3(PO_4)_2+4H_2O$ M.W. 335.06	....	.48	1.37	1.31
Magnesium Phosphate, Tertiary, Powd.	....	.31	1.05	....
Magnesium Silicate, Powd. $3MgSiO_3+5H_2O$ M.W. 391.34	....	.94	2.89	....
Magnesium Sulphate C.P., Spec. Cryst. ACS (Low in Ca) $MgSO_4.7H_2O$ M.W. 246.50	....	.25	.49	....
Magnesium Sulphate C.P., Cryst. 25-lb. keg, **$ .26 lb.**	....	.21	.43	.48
Magnesium Sulphate U.S.P. (Epsom Salts), Bulk 10 lbs., **$ .07 lb.; 25 lbs., $ .06 lb.; 50 lbs., $ .05 lb.; 100 lbs., $ .04 lb.**				
Magnesium Sulphate C.P., Dried Powd.	....	.26	.62	.57
Magnesium Sulphate, Purified, Dried Powd.	....	....	.29	.26
Magnesium Sulphite $MgSO_3+6H_2O$ M.W. 212.48	.22	.52	1.79	1.73
Magnesium Trisilicate, Powd. $3MgSiO_3+5H_2O$ M.W. 391.34	.16	.32	1.00	.95
Manganese Metal, 96% Min., (Carbon Free) Mn. At. Wt. 54.93	.13	.33	1.11	....
Manganese Dioxide C.P., Artificial, Powd. MnO_2 M.W. 86.93 25-lb. keg, **$ .79 lb.**	....	.40	1.11	1.05
Manganese Dioxide, Native, Ignited (Powd.—$MnO_2+87.5\%$) MnO_2 M.W. 86.93	....	....	.52	.46
Manganese Dioxide, Native, Ignited, (Coarse—$MnO_2+87.5\%$)	....	....	.47	.40
Manganese Dioxide, Tech., Black (Coarse—Approximately 85% Native) (Powder—Same price as coarse)	....	....	.22	.20
Manganese Dioxide, Tech., Bulk 10 lbs., **$ .12 lb.; 25 lbs., $ .10 lb.; 50 lbs., $ .09 lb.; 100 lbs., $ .08 lb.**	....	....	.16	.14
Manganese Sesquioxide, Black, Powd. (Manganic Oxide) Mn_2O_3 M.W. 157.86	....	....	1.70	....
Manganous Acetate C.P., Cryst. $Mn(CH_3COO)_2.4H_2O$ M.W. 245.06	.36	1.01	3.07	....
Manganous Borate, Powd.	.29	.72	2.00	....

*Case and bottles $5.50 extra and returnable.
**Carboy $5.00 extra and returnable.
***Case and bottles included.
****Container extra and returnable.

	1 oz. Each	¼ lb. Each	1 lb. Each	5 lbs. Per lb.
Manganous Carbonate C.P., Powd. $MnCO_3$ M.W. 114.93	....	$ .55	$1.59	$1.53
Manganous Carbonate, Powd.	....	.23	.72	.68
Manganous Chloride C.P., Cryst. $MnCl_2.4H_2O$ M.W. 197.91	$ .23	.34	.91	.86
Manganous Chloride, Purified, Cryst.	....	....	.48	.43
Manganous Nitrate C.P., Sol. $Mn(NO_3)_2$ M.W. 178.95	....	.46	1.11	.91
Manganous Peroxide—See Manganese Dioxide.				
Manganous Phosphate C.P., Powd.	....	.99	2.63	....
Manganous Sulphate C.P., Fine Cryst. $MnSO_4.2H_2O$ M.W. 187.02 25-lb. keg, **$ .67 lb.**	....	.35	.94	.88
Manganous Sulphate C.P., Coarse Cryst.	....	....	1.00	.95
Manganous Sulphate, Purified, Cryst.	....	.24	.68	.62
Marble Chips, Tech., (For Generating CO_2) 25-lb. drum, **$ .07 lb.**	....	....	.15	.13
Menthol U.S.P. $C_{10}H_{19}OH$ M.W. 156.21	.40	1.25	4.71	4.49
Mercury Metal C.P. Hg. At. Wt. 200.61 10-lb. bottle, **$2.08 lb.**	....	.73	2.18	2.11
Mercury Metal U.S.P., Redist., (Quicksilver) 10-lb. bottle, **$1.77 lb.**	....	....	1.87	1.79
Mercury Metal, (Quicksilver), Virgin 10 lbs., **$1.40 lb.;** 25 lbs., **$1.30 lb.** 76-lb. flasks, **$86.00 ea.**	.18	.50	1.60	1.50
Mercury Bichloride—See Mercuric Chloride.				
Mercury Bisulphate—See Mercuric Sulphate.				
Mercury Subnitrate—See Mercurous Nitrate.				
Mercuric Acetate C.P., Powd. $Hg(CH_3COO)_2$ M.W. 318.66	.42	1.34	4.24	4.19
Mercuric Acetate, Powd.	....	....	3.06	3.00
Mercuric Bromide C.P., Cryst. ACS $HgBr_2$ M.W. 360.44	.57	1.86	5.98	5.93
Mercuric Chloride C.P., Powd. ACS $HgCl_2$ M.W. 271.52 25-lb. keg, **$2.07 lb.**	.29	.85	2.57	2.52
Mercuric Chloride U.S.P., Powd. (Corrosive Sublimate) (Mercury Bichloride)	.21	.45	1.50	1.44
Mercuric Chloride U.S.P., Cryst.	.22	.49	1.69	1.64
Mercuric Chloride Ammoniated U.S.P., Powd. (White Precipitate)	.25	.60	2.12	2.07
Mercuric Cyanide C.P., Powd. $Hg(CN)_2$ M.W. 252.63	.46	1.44	4.59	4.54
Mercuric Cyanide, Purified, Powd.	....	....	3.90	3.84
Mercuric Iodide C.P., Powd. HgI_2 M.W. 454.47	.56	1.82	5.85	5.80
Mercuric Iodide, NF, Red	.42	1.27	4.81	4.76
Mercuric Nitrate C.P., Cryst. $Hg(NO_3)_2$ M.W. 324.62 25-lb. jar, **$2.81 lb.**	.47	1.20	3.58	3.38
Mercuric Nitrate, Purified, Cryst.	.39	.89	3.00	2.81
Mercuric Oxide C.P., Red, Powd. HgO M.W. 216.61	.33	1.01	3.16	3.11
Mercuric Oxide, NF, Red, Powd.	.25	.62	2.18	2.13
Mercuric Oxide C.P., Yellow, Powd.	.36	1.14	3.58	3.52
Mercuric Oxide U.S.P., Yellow, Powd.	.26	.69	2.47	2.42
Mercuric Oxide, Tech., Yellow	....	....	1.78	1.73
Mercuric Oxide, Tech., Red, Powd.	....	....	1.86	1.81
Mercuric Sulphate C.P., Powd. $HgSO_4$ M.W. 296.66	.30	.90	2.77	2.72
Mercuric Sulphate, Purified (Normal) (Mercury Bisulphate)	....	....	2.30	2.25
Mercuric Sulphide C.P., Red, Powd.	.40	1.27	4.07	....
Mercuric Sulphide HgS M.W. 232.67	....	.64	2.29	2.22
Mercurous Chloride C.P., Powd. ACS HgCl M.W. 236.06	.31	.96	2.96	2.91
Mercurous Chloride U.S.P. (Calomel)	.22	.54	1.89	1.83
Mercurous Iodide U.S.P., Yellow HgI M.W. 327.52	.42	1.31	4.94	4.89
Mercurous Nitrate C.P., Cryst. $HgNO_3.H_2O$ M.W. 280.62 25-lb. jar, **$2.98 lb.**	.48	1.26	3.77	3.58
Mercurous Nitrate, Cryst.	.39	.90	3.06	2.86
Mercurous Sulphate C.P., Powd. Hg_2SO_4 M.W. 497.26	.38	1.09	3.42	3.37
Mercurous Sulphate, Tech.	....	.85	2.60	....
Metal, Arnd's Alloy	.56	1.85	5.98	....
Metal, Devarda's Alloy (For Reduction) (20 Mesh and Finer)	....	.57	1.73	1.69
Metal, Wood's Alloy, Fusible, Stick	.33	.77	2.39	2.35
Metal, Rose's Alloy, Fusible, Stick	.33	.87	2.76	2.72
Methanol—See Alcohol, Methyl.				
Methenamine U.S.P.—See Hexamethylenamine.				
Methyl Acetate, Liquid $CH_3.COOCH_3$ M.W. 74.06	.14	.24	.65	....
Methyl Chloride (Artic Gas) CH_3Cl M.W. 50.49 20-lb. cylinder, **$ .50 lb.****;** 60-lb. cylinder, **$ .40 lb.****;** 90-lb. cylinder, **$ .40 lb.****;** 130-lb. cylinder, **$ .40 lb.******				
Methyl Iodide C.P. CH_3I M.W. 141.95	.66	1.92	5.98	....
Methyl Iodide, Liquid CH_3I M.W. 141.95	.47	1.51	4.98	....
Methyl Orange, Powd. $(CH_3)_2:N.C_6H_4.N:N.C_6H_4SO_3NA$ M.W. 327.27	.48	1.39	4.80	....
Methyl Red, Cryst. $(CH_3)_2NC_6H_4N:NC_6H_4COOH$ M.W. 269.22	1.16	3.98	13.03	....
Methyl Salicylate, Liquid U.S.P. (Synthetic Wintergreen Oil)	....	.25	.72	.65
Metol—See Pictol.				
Microcosmic Salt—See Sodium Ammonium Phosphate.				
Milk Sugar—See Lactose.				
Mohr's Salt—See Ferrous Ammonium Sulphate.				
Molybdenum Trioxide—See Acid, Molybdic.				
Monochlor-Benzol C_6H_5Cl M.W. 112.53	....	....	.51	....
Monsel's Salt—See Ferric Sulphate Basic.				
Muriatic Acid—See Acid, Hydrochloric.				
Muriate of Ammonia—See Ammonium Chloride.				
Naphthalene C.P., Cryst. (by Alcohol) $C_{10}H_7$ M.W. 128.11	....	.46	1.27	1.22
Naphthalene, Resublimed	....	....	.30	.27

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*Case and bottles $5.50 extra and returnable.

**Carboy $5.00 extra and returnable.

***Case and bottles included.

****Container extra and returnable.

	1 oz. Each	¼ lb. Each	1 lb. Each	5 lbs. Per lb.
Naphthalene U.S.P., Cryst.	....	....	$ .34	....
Naphthalene, Flake, Bulk 10 lbs., **$ .15 lb.;** 25 lbs., **$ .12 lb.;** 50 lbs., **$ .11 lb.;** 100 lbs., **$ .10½ lb.**	....	....	....	$ .16
Naphthol, Alpha, Purified, for Sugar Test $C_{10}H_7.OH$ M.W. 144.11	$ .29	$ .75	2.28	....
Naphthol, Alpha, Tech.	....	.44	1.52	....
Naphthol U.S.P. Beta, Resublimed	.15	.28	.94	....
Naphthol C.P., Nitroso, Beta, Cryst.	.72	2.40	8.40	....
Naphthylamine, Alpha, Cryst. $C_{10}H_7.NH_2$ M.W. 143.03	.26	.40	1.04	....
Naphthylamine, Beta, Resublimed	....	....	1.50	....
Naphthylamine Hydrochloride C.P., Alpha, Cryst. (Alpha Naphthalamine Hydrochloride) $C_{10}H_7\ NH_2.HCl$ M.W. 179.60	.47	1.42	4.41	....
Nickel Metal C.P., Shot Ni At. Wt. 58.69	.29	.44	1.25	1.20
Nickel Metal C.P., Special, Shot (Low in Cobalt)	....	.64	1.95	....
Nickel (ous) Acetate C.P., Cryst. $Ni(CH_3COO)_2.4H_2O$ M.W. 248.812	....	.72	2.17	2.12
Nickel (ous) Acetate, Purified	.23	.56	1.95	1.90
Nickel (ous) Ammonium Sulphate C.P., Cryst. $NiSO_4(NH_4)_2SO_4.6H_2O$ M.W. 394.99	....	.39	1.07	1.01
Nickel (ous) Ammonium Sulphate, Purified, Cryst.	....	....	.46	....
Nickel Bromide $NiBr_2+3H_2O$ M.W. 272.57	.42	.93	3.16	....
Nickel (ous) Carbonate C.P., Powd. 25-lb. jar, **$1.21 lb.**	....	.72	2.15	2.09
Nickel (ous) Carbonate, Tech. Powd.	....	....	.94	.91
Nickel (ous) Chloride C.P., Cryst. $NiCl_2.6H_2O$ M.W. 237.70	.20	.53	1.55	1.50
Nickel (ous) Chloride C.P., Special, Cryst. (Low in Cobalt)	.40	1.05	3.28	3.22
Nickel (ous) Chloride, Tech., Cryst.	....	....	.53	.48
Nickel (ous) Fluoride C.P., Special (Co. Free) NiF_2 M.W. 96.69	....	1.39	4.42	....
Nickel (ous) Formate, Tech.	....	....	1.12	....
Nickel (ous) Hydroxide, Powd. $Ni\ (OH)_2.H_2O$ M.W. 110.71	.39	1.17	3.25	....
Nickel (ous) Nitrate C.P., Cryst. $Ni(NO_3)_2.6H_2O$ M.W. 290.80 25-lb. jar, **$1.09 lb.**	.18	.49	1.42	1.22
Nickel (ous) Nitrate C.P., Spec., Cryst. (Low in Cobalt)	....	1.16	3.44	3.25
Nickel (ous) Nitrate, Purified, Cryst.	.14	.42	1.16	.98
Nickel (ous) Oxalate C.P., Powd. $NiC_2O_4.2H_2O$ M.W. 182.72	....	....	2.99	....
Nickel (ic) Oxide, Gray Black, Powd. Ni_2O_3 M.W. 165.36	....	1.24	3.86	3.81
Nickel (ous) Oxide, Green, Powd. NiO M.W. 74.68	.40	1.17	3.56	3.51
Nickel (ous) Phosphate C.P., Powd. $Ni_3(PO_4)_2.7H_2O$ M.W. 492.23	....	.90	2.69	....
Nickel Salts, Single, Bulk, (Nickel Sulphate) $NiSO_4.6H_2O$ M.W. 262.85 10 lbs., **$ .19 lb.;** 25 lbs., **$ .17 lb.;** 50 lbs., **$ .16½ lb.;** 100 lbs., **$ .16 lb.**	....	....	....	.21
Nickel Salts, Double, Bulk, (Nickel Ammonium Sulphate) $NiSO_4(NH_4)_2SO_4.6H_2O$ M.W. 394.99 10 lbs., **$ .19 lb.;** 25 lbs., **$ .17 lb.;** 50 lbs., **$ .16½ lb.;** 100 lbs., **$ .16 lb.**	....	....	....	.21
Nickel (ous) Sulphate C.P., Cryst. $NiSO_4.6H_2O$ M.W. 262.85	.30	.47	1.33	1.27
Nickel (ous) Sulphate C.P., Spec. Cryst. (Low in Cobalt)	....	.86	2.64	2.59
Nickel (ous) Sulphate C.P., Anhyd., Powd. $NiSO_4$ M.W. 154.74	....	.66	1.87	....
Nickel (ous) Tartrate C.P., Powd. $NiC_4H_4O_6$ M.W. 206.732	....	.88	2.61	....
Nitre—See Potassium Nitrate.				
Nitre Cake Ground—See Sod. Bisulphate Fused.				
Nitro Benzene Mono, Liquid (Benzol)	....	....	.48	.42
Nitro Benzene Di, Cryst. (Benzol)	....	....	.68	....
Nitroso Beta Naphthol—See Naphthol, Nitroso, Beta.				
Oil, Castor	....	....	.47	.42
Oil, Castor, Sulphonated 1-gal. can, **$1.80 gal.**	....	....	.50	.45
Oil, Cottonseed	....	....	.49	.44
Oil, Olive	....	....	.92	....
Oil, Palm	....	....	.45	....
Oil, Paraffine, Amber	....	....	.44	....
Oil, Paraffine, U.S.P. White	....	.14	.35	....
Oil of Vitriol—See Acid, Sulphuric, Com'l.				
Oil, Wintergreen, Synthetic—See Methyl Salicylate.				
Ortho Toluidine—See Toluidine, Ortho.				
Oxone Cubes, For generating Oxygen 2½-lb. can, **$2.25 ea.**				
Palladium Chloride C.P. 1 gram bottle, **$1.56 gram.**				
Paraffine—See Wax.				
Paraformaldehyde, Photo (Trioxymethylene)	....	.24	.69	.62
Paraformaldehyde U.S.P.	....	.18	.53	.48
Paradichlorobenzine, Cryst., Bulk (Disinfectant and Deodorant) 25 lbs., **$ .18 lb.;** 100 lbs., **$ .15½ lb.;** 200 lbs., **$ .14½ lb.**	....	....	.36	.27
Paraldehyde U.S.P. $(CH_3.CHO)_3$ M.W. 132.13	.14	.26	.77	.65
Parlodion, Shreds 25-oz. bottle, **$ .90 oz.**	1.00	....	....	....
Paris Green (Insecticide) 14-lb. pkgs., **$ .36 lb.;** 100 lbs., **$ .33½ lb.;** 270 lbs., **$ .31½ lb.**				
Pearl Ash—See Potassium Carbonate.				
Peptone, Powd., Bacteriological	.40	1.26	3.85	....
Perchloron (65% Available Chlorine) 1 can (3¾ lb.), **$2.00 ea.;** 12 cans (1 case), **$18.00 case;** 36 cans (3 cases), **$16.50 case;** 75-lb. drum, **$23.00 ea.**				
Petrolatum, Liquid—See Oil, Paraffine.				
Petrolatum U.S.P., White	....	.14	.35	....
Petrolatum U.S.P., Amber	....	....	.44	...
Petrolatum Benzine—See Ether, Petroleum.				

*Case and bottles $5.50 extra and returnable.

**Carboy $5.00 extra and returnable.

***Case and bottles included.

****Container extra and returnable.

	1 oz. Each	¼ lb. Each	1 lb. Each	5 lbs. Per lb.
Phenol—See Acid, Carbolic.				
Phenolphthalein C.P. ACS $C_{20}H_{14}O_4$ M.W. 318.11	$ .26	$ .77	$2.31	....
Phenolphthalein U.S.P., Powd.	.20	.43	1.39	$1.30
Phenylhydrazine Base $C_6H_5.NH.NH_2$ M.W. 108.11	.56	1.67	6.11	....
Phanylhydrazine Hydrochloride $C_6H_8N_2.HCl$ M.W. 144.58	.72	2.18	8.13	....
Phenyl Salicylate—See Salol.				
Phloroglucin C.P., Cryst. $C_6H_3(OH)_3.2H_2O$ M.W. 162.11	1.94	7.60	....	....
Phosphoric Anhydride, Powd. (Acid Phosphoric Anhyd.) P_2O_5 M.W. 142.08 1-lb. gsb-can, **$1.46 lb.;** 3-lb. gsb-can, **$ .72 lb.**	.23	.34	1.08	....
Phosphorous, Yellow, NF, ⅝-in. sticks P At. Wt. 31.02	.26	.38	1.11	....
Phosphorous, Yellow, NF, 3/16-in. sticks	....	1.50	2.73	....
Phosphorous, Amorphous, (Red Powd.)	.21	.32	.90	....
Phosphorous Oxychloride, Liquid $POCl_3$ M.W. 153.42	.36	.68	1.63	....
Phosphorous Pentachloride PCl_5 M.W. 208.34	.39	.60	1.37	1.13
Phosphorous Pentaoxide—See Phosphoric Anhydride.				
Phosphorous Pentasulphide, Lump P_2S_5 M.W. 22.38	.42	.74	2.04	....
Phosphorous Trichloride C.P., Liquid PCl_3 M.W. 137.42	.46	.68	1.63	1.39
Phosphorous Trichloride, Tech., Liquid	.34	.49	1.11	.87
Pictol (Photo Developer) ½-lb. bottle, **$3.97 lb.**	.39	1.06	3.84	3.77
Pine Oil, Steam Distilled, (7.8 lb. per gal.) 1 gal., **$1.45 gal.;** 5 gal. **$1.20 gal.;** 10 gal., **$1.10 gal.;** 50-gal. drum, **$ .69 gal.**				
Pine Tar Oil (8 lb. per gal.) 1 gal., **$1.10 gal.;** 5 gal., **$ .85 gal.;** 10 gal., **$ .75 gal.;** 50-gal. drum, **$ .55 gal.**				
Plaster Paris, (Calcium Sulphate), Bulk 10 lbs., **$ .05 lb.;** 25 lbs., **$ .04 lb.;** 50 lbs., **$ .03½ lb.;** 100 lbs., **$ .03 lb.**	....	....	....	.10
Platinum Chloride C.P., Cryst. ⅛-oz. gsb., **$5.04 ea.;** ¼-oz. gsb., **$9.31 ea.;** 1-oz. gsb., **$36.40 ea.;** 1-gram gsb., **$1.95 ea.**				
Platinum Chloride, 10% Sol.	4.29	....	....	....
Platinum Chloride, 5% Sol.	2.31	....	....	....
Potassium Metal K At. Wt. 39.10	1.25	4.28	16.25	....
Potassium Acetate C.P., Cryst. $CH_3COO.K$ M.W. 98.12 25-lb. keg, **$ .54 lb.**	....	.30	.79	.74
Potassium Acetate U.S.P., Gran.	....	.25	.66	.57
Potassium Acid Phthalate—See Potassium Biphthalate.				
Potassium Alum—See Alum Potassium Sulphate.				
Potassium Ammonium Sulphate C.P., Cryst. $K_2SO_4(NH_4)_2SO_4$ M.W. 306.40	....	.68	1.96	....
Potassium Antimonate (Pyro) $K_2H_2Sb_2O_7+4H_2O$ M.W. 504.68	.51	1.47	4.71	....
Potassium Arsenate C.P., Cryst., Primary KH_2AsO_4 M.W. 180.08	....	.78	2.39	....
Potassium Arsenate, Purified, Primary, Cryst.	....	....	1.21	1.16
Potassium Arsenite C.P., Powd. KAsO M.W. 146.06	.27	.70	2.09	....
Potassium Arsenite, Pure	....	.31	.94	.88
Potassium Biborate—See Potassium Borate.				
Potassium Bicarbonate C.P., Cryst. $KHCO_3$ M.W. 100.10 25-lb. keg, **$ .30 lb.**	....	.22	.52	.47
Potassium Bicarbonate U.S.P., Gran.	....	....	.39	.36
Potassium Bicarbonate U.S.P., Powd.	....	....	.42	.39
Potassium Bichromate C.P., Cryst. ACS (Potassium Dichromate) $K_2Cr_2O_7$ M.W. 294.21 25-lb. keg, **$ .53 lb.**	.25	.30	.78	.73
Potassium Bichromate, Purified, Cryst.	....	....	.49	.43
Potassium Bichromate, Powd. 25-lb. drum, **$ .19 lb.**	....	....	.34	.31
Potassium Bichromate, Cryst. 5 lbs., **$ .22 lb.;** 10 lbs., **$ .20 lb.;** 25 lbs., **$ .18 lb.** 50 lbs., **$ .16 lb.;** 100 lbs., **$ .14 lb.**				
Potassium Binoxalate C.P., Cryst. KHC_2O_4 M.W. 128.11	....	.44	1.24	1.18
Potassium Binoxalate, Tech., Cryst.	....	....	.61	.59
Potassium Biphosphate—See Potassium Phosphate, Primary.				
Potassium Biphthalate C.P., ACS (Potassium Acid Phthalate) $KHC_8H_4O_4$ M.W. 204.135	....	.61	1.79	....
Potassium Bisulphate C.P., Cryst. $KHSO_4$ M.W. 136.17 25-lb. jar, **$ .55 lb.**	.25	.30	.78	.73
Potassium Bisulphate C.P., Fused, Lump 25-lb. jar, **$ .61 lb.**	....	.33	.85	.79
Potassium Bisulphate C.P., Fused, Powd. 25-lb. jar, **$ .72 lb.**	....	....	.98	.92
Potassium Bisulphate C.P., Spec. Fused Lump ACS	....	.35	.87	.82
Potassium Bisulphate, Fused, Tech., Small Lump	....	....	.44	....
Potassium Bisulphate, Tech., Cryst.	....	....	.44	.39
Potassium Bisulphite C.P., Cryst. (Meta) $K_2S_2O_5$ M.W. 22.32	....	.29	.73	.68
Potassium Bisulphite, Purified, Cryst. (Meta)	....	.18	.40	.35
Potassium Bitartrate C.P., Powd. $KHC_4H_4O_6$ M.W. 188.14	.25	.31	.81	.75
Potassium Bitartrate U.S.P., Powd. (Cream of Tartar)	....	.26	.42	.39
Potassium Bitartrate, Crude—See Argols.				
Potassium Borate C.P., Gran. (Tetra) $K_2B_4O_7.5H_2O$ M.W. 323.56	.39	.60	1.77	1.72
Potassium Bromate C.P., Powd. ACS $KBrO_3$ M.W. 167.01	.21	.53	1.56	1.51
Potassium Bromate, Purified, Powd.	....	.29	.86	.81
Potassium Bromide C.P., Cryst. ACS KBr M.W. 119.01 25-lb. keg, **$ .64 lb.**	.23	.34	.91	.86
Potassium Bromide U.S.P., Cryst. or Gran.	....	.19	.59	.56
Potassium Bromide U.S.P., Powd.	....	.25	.70	.65
Potassium Carbonate C.P., Cryst. $K_2CO_3.1\text{-}\frac{1}{2}H_2O$ M.W. 165.23 25-lb. jar, **$ .61 lb.**	....	.33	.85	.79
Potassium Carbonate C.P., Anhyd. ACS K_2CO_3 M.W. 138.19 25-lb. can, **$ .53 lb.**	....	.30	.78	.73
Potassium Carbonate, Purified (Calcined Powd.)	....	.22	.52	.47
Potassium Carbonate, 96-98%, (Pearl Ash), Granular, Assay Grade 5 lbs., **$ .20 lb.;** 10 lbs., **$ .19 lb.;** 25 lbs., **$ .18 lb.;** 50 lbs., **$ .17 lb.;** 100 lbs., **$ .16 lb.;** 350-lb. bbl., **$ .15 lb.**				

*Case and bottles $5.50 extra and returnable.
***Case and bottles included.

**Carboy $5.00 extra and returnable.
****Container extra and returnable.

	1 oz. Each	¼ lb. Each	1 lb. Each	5 lbs. Per lb.
Potassium Chlorate C.P., Cryst. $KClO_3$ M.W. 122.55 25-lb. keg, $ **.40 lb.**	....	$ .26	$ .62	$ .57
Potassium Chlorate C.P., Special Cryst., ACS	....	.27	.64	.59
Potassium Chlorate U.S.P., Cryst.	....	....	.29	.26
Potassium Chlorate U.S.P., Gran.	....	....	.46	.43
Potassium Chlorate U.S.P., Powd.	....	....	.34	.31
Potassium Chlorate, Cryst., Bulk 10 lbs., $ **.19 lb.; 25 lbs., $ .17 lb.;** 50 lbs., $ **.15 lb.;** 100 lbs., $ **.14 lb.**	....	....	.25	.21
Potassium Chloride C.P., Cryst. ACS KCl M.W. 74.55 25-lb. keg, $ **.40 lb.**	....	.23	.55	.49
Potassium Chloride C.P., Spec., Cryst. ACS (Low in SO_4 and PO_4)	....	.34	.90	.85
Potassium Chloride C.P., Spec., Cryst. ACS (For Calomel Electrodes)	$ .13	.25	.59	....
Potassium Chloride (Double Refined)	....	....	.29	....
Potassium Chloride, NF, Cryst.	....	....	.30	.27
Potassium Chloride, Tech.	....	....	.25	.20
Potassium Chromate C.P., Cryst. ACS K_2CrO_4 M.W. 194.20 25-lb. keg, $ **.58 lb.**	.25	.31	.83	.78
Potassium Chromate, Purified, Yellow, Cryst.	....	.17	.51	.48
Potassium Chromate, Purified, Powd.	....	....	.55	.52
Potassium Citrate C.P., Cryst. $K_3C_6H_5O_7.H_2O$ M.W. 324.34	....	.43	1.21	1.16
Potassium Citrate U.S.P., Gran.	....	....	.63	.59
Potassium Cyanate C.P. KCNO M.W. 81.11	.79	2.63	8.53	....
Potassium Cyanide C.P., Gran. KCN M.W. 65.10	.34	.49	1.42	1.37
Potassium Cyanide, Gran. (About 95%)	....	.31	1.03	.99
Potassium Dichromate—See Potassium Bichromate.				
Potassium Ferricyanide C.P., Cryst. ACS $K_3Fe(CN)_6$ M.W. 329.18	.18	.49	1.43	1.38
Potassium Ferricyanide, Purified, Cryst.	....	.28	.90	.86
Potassium Ferricyanide, Tech., Cryst.	....	.23	.70	.66
Potassium Ferrocyanide C.P., Cryst. ACS $K_4Fe(CN)_6.3H_2O$ M.W. 422.32 25-lb. keg, $ **.81 lb.**	.16	.40	1.12	1.07
Potassium Ferrocyanide, Cryst.	....	.18	.49	.46
Potassium Ferrocyanide, Powd.	....	....	.60	.56
Potassium Fluoride C.P., Cryst. $KF.2H_2O$ M.W. 94.13 25-lb. jar, $ **.94 lb.**	....	.51	1.37	1.25
Potassium Fluoride, Tech., Cryst.	....	....	1.16	1.07
Potassium Formate C.P., Cryst. KCOOH M.W. 84.11	....	.65	1.91	....
Potassium Glycerophosphate, 75% $C_3H_7O_3PO(OH)_2$ M.W. 302.36	.22	.49	1.69	1.64
Potassium Hydroxide C.P. ACS KOH M.W. 56.10 (Caustic Potash) Sticks or Pellets 25-lb. can, $ **.54 lb.**	....	.30	.78	.73
Potassium Hydroxide U.S.P., Sticks or Pellets (Caustic Potash) 10-lb. can, $ **.51 lb.**	....	.25	.66	.61
Potassium Hydroxide U.S.P., Lump (Caustic Potash)	....	....	.61	.56
Potassium Hydroxide, Tech., Flake, 88-92% (Caustic Potash)	....	....	.30	.26
Potassium Hydroxide, Tech., Small Lumps (Caustic Potash) 10-lb. can, $ **.18 lb.** 25-lb. can, $ **.16 lb.;** 50-lb. can, $ **.15 lb.;** 100-lb. can, $ **.14 lb.**	....	....	.25	.20
Potassium Hypophosphite, NF KPH_2O_2 M.W. 104.16	....	....	1.21	1.14
Potassium Iodate C.P., Cryst. ACS KIO_3 M.W. 214.03	.49	1.59	5.04	4.99
Potassium Iodate, Purified, Cryst.	.38	1.16	4.26	4.30
Potassium Iodide C.P., Cryst. or Gran. ACS KI M.W. 166.03 25-lb. can, **$2.07 lb.**	.29	.85	2.57	2.52
Potassium Iodide C.P., Spec., Cryst. ACS (Low in Iodates)	.34	.99	3.02	2.98
Potassium Iodide U.S.P., Gran., Cryst. or Powd.	.19	.45	1.51	1.46
Potassium Mercuric Iodide C.P.	.98	3.38	11.70	....
Potassium Meta Bisulphite—See Potassium Bisulphite, Meta.				
Potassium Molybdate C.P. $K_2MoO_4.5H_2O$ M.W. 328.28	.60	1.92	....	....
Potassium Monophosphate—See Potassium Phosphate, Secondary.				
Potassium Nitrate C.P., Cryst. ACS KNO_3 M.W. 101.11 25-lb. keg, $ **.33 lb.**	....	.23	.56	.51
Potassium Nitrate C.P., Fused Stick	....	.44	1.18	....
Potassium Nitrate U.S.P., Gran.	....	....	.29	.26
Potassium Nitrate U.S.P., Powd.	....	....	.30	.27
Potassium Nitrate, Gran., Assayers Grade (Salt Petre) (Nitre) 10 lbs., $ **.16 lb.;** 25 lbs., $ **.13 lb.;** 50 lbs., $ **.12 lb.;** 100 lbs., $ **.11 lb.;** 400-lb. bbls., $ **.10 lb.**	....	....	.26	.18
Potassium Nitrite C.P., Cryst. KNO_2 M.W. 85.1	.20	.53	1.56	1.51
Potassium Nitrite C.P., Sticks	....	.64	1.89	1.83
Potassium Nitrite, Cryst. (Contains 5 to 15% Chlorides)	....	.36	1.14	1.09
Potassium Oxalate C.P., Cryst. ACS $K_2C_2O_4.H_2O$ M.W. 184.21 25-lb. keg, $ **.79 lb.**	.16	.40	1.11	1.05
Potassium Oxalate C.P., Dried Powd.	....	.56	1.55	....
Potassium Oxalate, Purified, Neutral	....	.20	.61	.59
Potassium Perchlorate C.P., Cryst. $KClO_4$ M.W. 138.55 25-lb. keg, **$1.16 lb.**	.35	.51	1.52	1.47
Potassium Periodate C.P. KIO_4 M.W. 230.03	1.74	5.99	20.00	....
Potassium Permanganate C.P., Cryst. $KMnO_4$ M.W. 158.03 25-lb. can, $ **.59 lb.**	.25	.33	.85	.79
Potassium Permanganate C.P., Special ACS (Low in Sulphate)	....	.47	1.33	1.27
Potassium Permanganate U.S.P., Cryst.	....	.18	.51	.47
Potassium Persulphate C.P. $K_2S_2O_8$ M.W. 270.32 25-lb. keg, $ **.93 lb.**	.31	.44	1.26	1.21
Potassium Persulphate C.P. (Low in Chlorine)	....	1.57	5.01	....
Potassium Persulphate C.P. (Low in Nitrogen)	.56	1.82	5.82	....
Potassium Phosphate C.P., Primary, Cryst. ACS (Dihydrogen) KH_2PO_4 M.W. 136.14	.25	.40	1.13	1.08
Potassium Phosphate C.P., Secondary, Powd. (Dipotassium) K_2HPO_4 M.W. 174.25	.35	.44	1.26	1.21
Potassium Phosphate, Purified, Secondary Powd., (Dipotassium)	....	....	.98	.92
Potassium Phosphate C.P., Tertiary (Tripotassium) K_3PO_4 M.W. 212.34	.33	.48	1.38	1.33
Potassium Phosphate, Tertiary	....	.38	1.15	1.07

*Case and bottles $5.50 extra and returnable.

**Carboy $5.00 extra and returnable.

***Case and bottles included.

****Container extra and returnable.

	1 oz. Each	¼ lb. Each	1 lb. Each	5 lbs. Per lb*
Potassium Prussiate, Red—See Potassium Ferricyanide.				
Potassium Prussiate, Yellow—See Potassium Ferrocyanide.				
Potassium Pyroantimoniate—See Potassium Antimoniate.				
Potassium Pyrosulphate—See Potassium Bisulphate, Fused.				
Potassium Silico-Fluoride, Powd. K_2SiF_6 M.W. 220.30	....	$ .83	$2.57	....
Potassium Sodium Tartrate C.P., Fine Cryst. $KNaC_4H_4O_6.4H_2O$ M.W. 282.22 25-lb. keg, **$ .51 lb.**	....	.29	.73	$ .68
Potassium Sodium Tartrate C.P., Large Cryst. ACS 25-lb. keg, **$ .51 lb.**	....	.29	.73	.68
Potassium Sodium Tartrate C.P., Powd. 25-lb. keg, **$ .51 lb.**	....	....	.73	.68
Potassium Sodium Tartrate U.S.P., Cryst., Gran. or Powd. (Rochelle Salts)	....	....	.36	.33
Potassium Sulphate C.P., Coarse Cryst. ACS K_2SO_4 M.W. 174.26 25-lb. keg, **$ .30 lb.**	....	.22	.52	.47
Potassium Sulphate C.P., Powd. ACS 25-lb. keg, **$ .36 lb.**	....	.25	.59	.53
Potassium Sulphate C.P., Special ACS (Low in As) (Coarse Cryst. or Powd.—Please specify which) 25-lb. keg, **$ .47 lb.**	....	.39	.72	.66
Potassium Sulphate, Powd. (Double Refined)	....	....	.33	.27
Potassium Sulphate, NF, Cryst.	....	....	.38	.35
Potassium Sulphate, NF, Powd.	....	....	.39	.36
Potassium Sulphate, Tech. (Low in Nitrogen)	....	....	.46	.40
Potassium Sulphide U.S.P., Fused, Small Pieces, (Sulphuret, Liver of Sulphur) K_2S M.W. 110.26	....	.21	.55	.48
Potassium Sulphide, Tech., Fused, Small Pieces (Sulphuret, Liver of Sulphur)	....	.20	.52	.46
Potassium Sulphite C.P., Anhyd. Powd. K_2SO_3 M.W. 158.23	....	.39	1.04	.99
Potassium Sulphite, Purified, Anhyd. Powd.	....	....	.73	.68
Potassium Sulphocyanide—See Potassium Thiocyanate.				
Potassium Tartrate C.P., Cryst. $K_2C_4H_4O_6.\frac{1}{2}H_2O$ M.W. 235.23	$ .38	.53	1.53	1.48
Potassium Tartrate, Purified, Neutral	....	....	.87	.83
Potassium Tetraborate—See Potassium Borate.				
Potassium Tetroxalate C.P., Cryst. $KH_3(C_2O_4)_2.2H_2O$ M.W. 254.18	....	.48	1.38	....
Potassium Thiocyanate C.P., Cryst. (Potassium Sulphocyanide or Sulphocyanate) KSCN M.W. 97.17 25-lb. jar, **$1.21 lb.**	.20	.53	1.55	1.50
Potassium Thiocyanate, NF, Cryst.	....	.40	1.33	1.27
Potassium Thiocyanate, Tech., Cryst.	....	....	1.03	.98
Pumice Powd., No. O, Bulk 5 lbs., **$ .10 lb.;** 10 lbs., **$ .09 lb.;** 25 lbs., **$ .08 lb.;** 50 lbs., **$ .07 lb.;** 100 lbs., **$ .06 lb.;** 250-lb. bbls., **$5.75 cwt.**				
Pumice Stone, Lump, Bulk 5 lbs., **$ .30 lb.;** 10 lbs., **$ .25 lb.;** 25 lbs., **$ .20 lb.;** 50 lbs., **$ .18 lb.;** 100 lbs., **$ .16 lb.**				
Pyridine C.P., Liquid C_5H_5N M.W. 79.11	.25	.70	2.11	2.05
Pyridine, Pure, Liquid	....	....	1.17	1.12
Pyrogallol—See Acid Pyrogallic.				
Quicksilver—See Mercury.				
Quinine Sulphate U.S.P. $(C_{20}H_{24}N_2O_2)_2.H_2SO_4.7H_2O$ M.W. 872.80 1-oz. can, **$ .92 oz.;** 5-oz. can, **$ .90 oz.;** 50-oz. can, **$ .88 oz.;** 100-oz. can, **$ .86 oz.**				
Red Lead—See Lead Oxide.				
Reddle—See Page 308.				
Rennin 1:25000	.42	1.44	....	....
Resorcinol C.P. Cryst. (Resorcin)	.35	1.11	3.47	3.42
Resorcinol U.S.P., Fine Cryst. (Resorcin) $C_6H_4(OH)_2$ M.W. 110.08	.27	.68	2.38	2.28
Resorcinol U.S.P., Powd. (Resorcin)	.29	.70	2.44	2.34
Rochelle Salt—See Sodium Potassium Tartrate.				
Rose's Alloy—See Metal, Rose's Alloy.				
Rosin, Lump, "N," Bulk 1 lb., **$ .25 lb.;** 10 lbs., **$ .15 lb.;** 25 lbs., **$ .13 lb.;** 100 lbs., **$ .11 lb.;** 500-lb. bbls., **$ .09 lb.**				
Saccharin C.P., Fine Cryst. $C_6H_4.SO_2.CO.NH$ M.W. 183.17	.43	1.34	4.21	....
Saccharin U.S.P., Insoluble	.21	.72	2.67	2.47
Saccharin U.S.P., Soluble, Powd. or Gran.	.21	.72	2.67	2.47
Saccharose—See Sucrose.				
Sal Ammoniac—See Ammonium Chloride.				
Sal Acetosella—See Potassium Binoxalate.				
Salol U.S.P., Gran. (Phenyl Salicylate) $C_6H_4(CH).COOC_6H_5$ M.W. 214.15	.17	.39	1.38	1.35
Sal Soda, (Sodium Carbonate Cryst.), Bulk, $Na_2CO_3.H_2O$ M.W. 123.99 10 lbs., **$ .08 lb.;** 25 lbs., **$ .05 lb.;** 100 lbs., **$ .03 lb.;** 350-lb. bbl., **$ .02½ lb.**				
Salt, Table, Bulk NaCl M.W. 58.45 25 lbs., **$ .03 lb.;** 50 lbs., **$ .02 lb.;** 100 lbs., **$ .01½ lb.**				
Saltpetre—See Potassium Nitrate.				
Sand, Standard Ottawa—See Page 70.				
Sand, White, (Sea Sand), Bulk 5 lbs., **$ .08 lb.;** 10 lbs., **$ .07 lb.;** 25 lbs., **$ .06 lb.;** 50 lbs., **$ .05 lb.;** 100 lbs., **$ .04 lb.**				
Sand, Washed and Ignited, Purified (For Boats)	....	....	.46	.42
Santosite—See Sodium Sulphite, Anhydrous.				
Saponin, Purified	.25	.61	2.15	....
Sealing Wax, Sticks	....	....	.72	....
Sealo—See Page 402.				

*Case and bottles $5.50 extra and returnable.

**Carboy $5.00 extra and returnable.

***Case and bottles included.

****Container extra and returnable.

	1 oz. Each	¼ lb. Each	1 lb. Each	5 lbs. Per lb.
Selenium Metal, Powd. Se At. Wt. 78.96	$ .39	$1.36	$5.17	....
Selenium Metal, Sticks	.35	1.22	4.60	....
Selenium Oxychloride	1.01	2.91	10.18	....
Silica, Powd., Assayers Grade, 60 mesh 10 lbs., **$ .06 lb.;** 25 lbs., **$ .05 lb.;** 50 lbs., **$ .04 lb.;** 100 lbs., **$ .03 lb.**				
Silex, Powd.	....	....	.30	$ .25
Silica, Precipitated—See Acid Silicic.				
Silicon, Lump Si At. Wt. 28.10	....	.27	.75	.70
Silver Metal Foil, C.P., .005″ Thick x 1⅜″ wide, 99.98% Pure, For Assaying, Ag At. Wt. 107.88 1 oz., **$1.40 oz.;** 5 oz., **$1.30 oz.;** 10 oz., **$1.20 oz.**				
Silver Acetate $AgCH_3COO$ M.W. 166.91	1.39	5.32	....	....
Silver Bromide AgBr M.W. 187.80	1.39	5.32	....	....
Silver Carbonate Ag_2CO_3 M.W. 275.77	1.39	5.32	....	....
Silver Chloride C.P., Powd. AgCl M.W. 143.34	1.14	4.31	16.85	....
Silver Cyanide AgCN M.W. 133.89	.74	2.68	....	....
Silver Iodide AgI M.W. 234.80	1.20	4.52	....	....
Silver Lactate $AgC_3H_5O_3+H_2O$ M.W. 214.95	1.33	5.04	....	....
Silver Nitrate C.P., Reagent Grade, Cryst. ACS $AgNO_3$ M.W. 169.89	.61	2.16	8.48	8.44
Silver Nitrate C.P., U.S.P., Cryst.	.52	1.84	7.04	6.99
Silver Nitrite $AgNO_2$ M.W. 153.89	1.40	5.36	....	....
Silver Nucleinate U.S.P., Contains 19-25% Ag. (Silver Protein Mild)	.54	1.88	7.14	....
Silver Oxide C.P., Powd. Ag_2O M.W. 231.76	1.07	4.08	....	....
Silver Sulphate C.P., Powd. ACS Ag_2SO_4 M.W. 311.82	1.21	4.56	17.92	....
Soapstone—See Talc, Powd.				
Soda Ash, (Sodium Carbonate) 58%, Light Na_2CO_3 M.W. 105.99 10 lbs., **$ .06 lb.;** 25 lbs., **$ .05 lb.;** 50 lbs., **$ .04 lb.;** 100 lbs., **$ .03½ lb.;** 150-lb. bag, **$2.88 cwt.** 300-lb. bbls., **$3.15 cwt.**	....	....	.10	.08
Soda Lime, (High Moisture), Spec., High Absorption Value (Approx. 90-10) For determination of CO_2 in Iron, Steel, Limestone and Organic Analysis (CO_2 absorption minimum 25%) 4 - 8 mesh and 12 - 20 mesh (Specify which)	....	....	3.00	....
Soda Lime, (High Moisture), (Approx. 90-10), For the Absorption of CO_2 and other Acid Gases. 4 - 8 - 12 or 20 and finer mesh. (Specify which)	....	....	.92	.87
Soda Lime, (Low Moisture), (Approx. 90-10), For the Absorption of Acid Gases. 4 - 8 - 12 or 20 mesh. (Specify which)	....	....	.48	.43
Soda Lime, (Low Moisture), (Approx. 90-10), For the Absorption of Acid Gases. 40 mesh and finer. (Specify which)	....	....	.46	.41
Soda Lime, (Low Moisture), Old process, (50-50), For the Absorption of Moisture, Acid Gases and CO_2. 4 - 8 - 12 or 20 mesh and finer. (Specify which)	....	....	.62	.57
Sodium Metal C.P., Lump Na At. Wt. 23	.31	.49	1.30	....
Sodium Metal, Lump	.26	.35	.85	.81
Sodium Acetate C.P., Cryst. ACS $CH_3COONa.3H_2O$ M.W. 136.07 25-lb. keg, **$ .43 lb.**	....	.23	.57	.52
Sodium Acetate, Tech., Cryst.	....	....	.33	.29
Sodium Acetate C.P., Fused, Cryst.	....	.30	.77	.72
Sodium Acetate, Fused, Cryst.	....	....	.57	.52
Sodium Acetate C.P., Anhyd. $CH_3COO.Na$ M.W. 82.032	....	.35	.94	.88
Sodium Acetate U.S.P., Bulk 5 lbs., **$ .27 lb.;** 10 lbs., **$ .24 lb.;** 25 lbs., **$ .22 lb.;** 50 lbs., **$ .21 lb.;** 100 lbs., **$ .20 lb.**				
Sodium Acid Sulphite—See Sodium Bisulphite.				
Sodium Aluminate, White, Soluble, Bulk 1 lb., **$ .20 lb.;** 5 lbs., **$ .16 lb.;** 10 lbs., **$ .15 lb.;** 25 lbs., **$ .14 lb.;** 50 lbs., **$ .13 lb.;** 100 lbs., **$ .12 lb.;** 325-lb. drum, **$ .11½ lb.**				
Sodium Ammonium Phosphate C.P., Cryst. $NaNH_4HPO_4.4H_2O$ M.W. 209.14 25-lb. keg, **$ .53 lb.**	.22	.30	.78	.73
Sodium Ammonium Phosphate, Purified, Cryst. (Microcosmic Salt)	....	....	.60	....
Sodium Arsenate C.P., Secondary, Cryst. $Na_2HAsO_4.7H_2O$ M.W. 312.08	.14	.34	.92	.87
Sodium Arsenate, NF Exsic	....	.36	1.14	....
Sodium Arsenite C.P., Meta., Powd. $NaAs_2O_3$ M.W. 129.91 25-lb. jar, **$ .58 lb.**	.13	.31	.81	.75
Sodium Arsenite, Purified, Meta, Powd.	....	.24	.68	....
Sodium Benzoate U.S.P., Powd. $NaC_7H_5O_2$ M.W. 144.08	.20	.26	.83	.82
Sodium Benzoate U.S.P., Bulk 10 lbs., **$ .58 lb.;** 25 lbs., **$ .55 lb.;** 50 lbs., **$ .34 lb.;** 100 to 900 lbs., **$ .50 lb.;** 1000 to 3900 lbs., **$ .47 lb.**				
Sodium Bicarbonate C.P., Powd. ACS $NaHCO_3$ M.W. 84.01 25-lb. keg, **$ .26 lb.**	....	.21	.48	.43
Sodium Bicarbonate U.S.P., Powd., Bulk 5 lbs., **$ .08 lb.;** 10 lbs., **$ .07 lb.;** 25 lbs., **$ .06 lb.;** 50 lbs., **$ .05 lb.;** 112-lb. keg, **$ .04½ lb.;** 400-lb. bbls., **$ .04 lb.**				
Sodium Bichromate C.P., Cryst. (Sodium Dichromate) $Na_2Cr_2O_7.2H_2O$ M.W. 298.05 25-lb. jar, **$ .55 lb.**	....	.30	.78	.73
Sodium Bichromate C.P., Fused Anhyd. Powd. $Na_2Cr_2O_7$ M.W. 262.15	....	.45	1.32	1.28
Sodium Bichromate, Tech., Cryst. (Sodium Dichromate) 25-lb. keg, **$ .16 lb.**	....	....	.38	.33
Sodium Bichromate, Cryst., Bulk (Dichromate) 10 lbs., **$ .16 lb.;** 25 lbs., **$ .14 lb.** 50 lbs., **$ .13 lb.;** 100 lbs., **$ .12 lb.;** 400-lb. bbl., **$ .10 lb.**	....	....	.20	.18
Sodium Bifluoride, Tech. NaF.HF M.W. 62.01	....	....	.55	....
Sodium Bioxalate C.P., Cryst. $NaHC_2O_4.H_2O$ M.W. 130.03	....	....	1.82	....
Sodium Biphosphate—See Sodium Phosphate ,Primary.				
Sodium Bismuthate C.P., Special, Powd. ACS (High Assay) $NaBiO_3$ M.W. 280.00	....	1.78	5.59	5.54
Sodium Bisulphate C.P., Cryst. $NaHSO_4H_2O$ M.W. 138.094 25-lb. jar, **$ .35 lb.**	....	.23	.55	.49
Sodium Bisulphate C.P., Fused $NaHSO_4$ M.W. 120.07	....	.31	.81	.75

*Case and bottles $5.50 extra and returnable.
***Case and bottles included.
**Carboy $5.00 extra and returnable.
****Container extra and returnable.

	1 oz. Each	¼ lb. Each	1 lb. Each	5 lbs. Per lb.
Sodium Bisulphate C.P., Spec., Fused ACS	....	$ .44	$1.18	....
Sodium Bisulphate, Tech., Cryst.	....	....	.29	$ .23
Sodium Bisulphide C.P., Solution (About 9% H_2S)	....	.40	.97	....
Sodium Bisulphite C.P., Gran. Meta $NaHSO_3$ M.W. 104.07 25-lb. can, **$ .32 lb.**	....	.23	.55	.49
Sodium Bisulphite C.P., Meta., Anhyd. Powd.	....	....	.47	.42
Sodium Bisulphite, Purified, Meta Dry	....	.14	.26	.22
Sodium Bisulphite, Pure, Dry, Crystals, Bulk 25 lbs., **$ .15 lb.;** 50 lbs., **$ .14 lb.**	....	....	.24	.20
Sodium Bitartrate C.P. $NaHC_4H_4O_6.H_2O$ M.W. 190.05	....	.42	1.16	....
Sodium Bitartrate, Purified	....	.95	1.00	....
Sodium Borate C.P., Cryst. ACS (Tetra) $Na_2B_4O_7.10H_2O$ M.W. 381.43. 25-lb. keg, **$ .23 lb.**	....	.20	.44	.39
Sodium Borate C.P., Powd., Tetra	....	.20	.44	.39
Sodium Borate C.P., Dried Powd., Tetra $Na_2B_4O_7.5H_2O$ M.W. 291.35	$ .33	.51	1.38	1.33
Sodium Borate U.S.P., Refined Cryst. or Powd. (Borax)	....	....	.23	.21
Sodium Bromate C.P., Cryst. $NaBrO_3$ M.W. 150.91	.26	.77	2.34	....
Sodium Bromate	.22	.53	1.82	1.77
Sodium Bromide C.P., Cryst. NaBr M.W. 102.92 25-lb. keg, **$ .54 lb.**	.22	.30	.79	.74
Sodium Bromide U.S.P., Gran.	....	.21	.61	.56
Sodium Bromide U.S.P., Powd.	....	....	.77	.72
Sodium Calcium Hydrate—See Soda Lime.				
Sodium Cacodylate U.S.P. $Na(CH_3)_2AsO_2+3H_2O$ M.W. 214.06	.59	1.97	7.60	....
Sodium Carbonate C.P., Cryst. $Na_2CO_3.H_2O$ M.W. 123.99 25-lb. keg, **$ .31 lb.**	....	.22	.53	.48
Sodium Carbonate C.P., Spec., Anhyd. Powd., ACS (Low in S and As)	.17	.36	.90	.85
Sodium Carbonate, Tech., Cryst.—See Sal Soda.				
Sodium Carbonate C.P., Anhyd. Powd. ACS Na_2CO_3 M.W. 105.99 25-lb. can, **$ .29 lb.**	....	.22	.51	.46
Sodium Carbonate, Purified, Anhyd., Powd.	....	....	.31	.27
Sodium Carbonate, Tech., Powd.—See Soda Ash.				
Sodium Carbonate U.S.P., Fine Cryst. (Monohydrate) 25-lb. can, **$ .10 lb.**	....	....	.27	.23
Sodium Carbonate, Pure, Photo (Monohydrated) 25-lb. drum, **$ .09 lb.**	....	....	.17	.12
Sodium Carbonate, Calcined, Assayers' Grade 10 lbs., **$ .10 lb.;** 25 lbs., **$ .09 lb.** 100 lbs., **$ .07 lb.;** 300-lb. bbls., **$ .06 lb.**	....	....	.15	.12
Sodium Chlorate C.P., Cryst. $NaClO_3$ M.W. 106.45 25-lb. keg, **$ .53 lb.**	....	.30	.78	.73
Sodium Chlorate U.S.P., Cryst.	....	....	.33	.30
Sodium Chlorate, Gran., Bulk, (Weed Killer) 1 to 25 lbs., **$ .20 lb.;** 25 lbs., **$ .15 lb.;** 50 lbs., **$ .13 lb.;** 100-lb. drum, **$ .11 lb.**				
Sodium Chloride C.P., Fine Cryst. ACS NaCl M.W. 58.45 25-lb. keg, **$ .29 lb.**	....	.22	.51	.46
Sodium Chloride C.P., Large Cryst.	....	.36	.87	.82
Sodium Chloride U.S.P., Gran. 25-lb. keg, **$ .09½ lb.**	....	....	.25	.22
Sodium Chloride C.P., Fused	....	.29	.65	.60
Sodium Chromate C.P., Cryst. $Na_2CrO_4.4H_2O$ M.W. 234.06	.23	.35	.94	.88
Sodium Chromate, Tech., Powd.	....	....	.55	....
Sodium Chromate, Fused, Powd. Na_2CrO_4 M.W. 162	....	.81	2.42	....
Sodium Citrate C.P., Cryst. $2Na_3C_6H_5O_7.11H_2O$ M.W. 714.32 25-lb. keg, **$ .69 lb.**	....	.36	.99	.94
Sodium Citrate U.S.P., Gran.	....	.20	.56	.51
Sodium Citrate U.S.P., Powd.	....	.21	.57	.52
Sodium Cobalti Nitrite C.P., Powd. $Co(NO_2)_3.3NaNO_2$ M.W. 404.024	.53	1.74	5.56	....
Sodium Cyanide C.P., Gran. ACS NaCN M.W. 49.01	.25	.30	.78	.73
Sodium Cyanide, 95-96%, Gran. (Equivalent to Potassium Cyanide about 129%)	....	.21	.38	.36
Sodium Cyanide, Hi-Cyan, Eggs, 96-98% 10-lb. can, **$ .32 lb.;** 25-lb. can, **$ .31 lb.;** 50-lb. can, **$ .29 lb.;** 100-lb. can, **$ .24 lb.**	....	....	.50	.33
Sodium Cyanide, (Case Hardener), 30%, Powd. 10-lb. can, **$ .28 lb.;** 25-lb. can, **$ .25 lb.;** 100-lb. can, **$ .24 lb.**	....	....	.35	.30
Sodium Dichromate—See Sodium Bichromate.				
Sodium Dioxide—See Sodium Peroxide.				
Sodium Ferrocyanide C.P., Cryst. $Na_4Fe(CN)_6.12H_2O$ M.W. 520.11	.23	.56	1.56	....
Sodium Ferrocyanide, Purified, Cryst. (Sodium Prussiate, Yellow)	....	.30	.46	.40
Sodium Fluoride C.P., Powd. ACS NaF M.W. 42.00 25-lb. keg, **$1.02 lb.**	.35	.48	1.37	1.31
Sodium Fluoride, 90%, Bulk 10 lbs., **$ .15 lb.;** 50 lbs., **$ .13 lb.;** 100 lbs., **$ .12 lb.;** 375-lb. bbls., **$ .11 lb.**				
Sodium Fluo-Silicate—See Sodium Silico-Fluoride.				
Sodium Formate C.P., Cryst. NaCOOH M.W. 68.01	....	.44	1.24	1.18
Sodium Formate, Purified, Cryst.	....	....	.96	.91
Sodium Glycocholate	.38	1.16	4.32	4.24
Sodium Glycerophosphate, NF, Cryst. $Na_2C_3H_5(OH)_2PO_4+5\frac{1}{2}H_2O$ M.W. 315.19.	....	.57	2.02	1.95
Sodium Glycerophosphate, NF, Powd.	....	.59	2.08	2.02
Sodium Hydrogen Carbonate—See Sodium Bicarbonate.				
Sodium Hydrogen Sulphate—See Sodium Bisulphate Cryst.				
Sodium Hydrosulphide—See Sodium Bisulphide, Solution.				
Sodium Hydrosulphite, Powd. $Na_2C_2O_4$ M.W. 174.12	....	.21	.55	.49
Sodium Hydroxide C.P., Sticks or Pellets ACS NaOH M.W. 40.01 10-lb. can, **$ .52 lb.;** 25-lb. can, **$ .41 lb.**	....	.26	.62	.57
Sodium Hydroxide C.P., Pellets (Low in Carbonate)	....	.25	.61	.56
Sodium Hydroxide C.P., Lump (from Sodium) (Low in CO_3 and Cl)	....	.46	1.24	1.16
Sodium Hydroxide U.S.P., Sticks or Pellets (Caustic Soda) 5-lb. can, **$ .44 lb.;** 10-lb. can, **$ .38 lb.**	....	.21	.53	.48
Sodium Hydroxide C.P., Spec. Sticks, ACS, (Low in CO_2, Cl, PO_4, and Te)	....	....	.73	.68

*Case and bottles $5.50 extra and returnable.
***Case and bottles included.

**Carboy $5.00 extra and returnable.
****Container extra and returnable.

	1 oz. Each	¼ lb. Each	1 lb. Each	5 lbs. Per lb.
Sodium Hydroxide, Purified, Flake (For Nitrogen Determination) 10-lb. can, **$ .25 lb.;** 25-lb. can, **$ .14 lb.;** 50-lb. can, **$ .13 lb.**	....	....	**$ .36**	**$ .31**
Sodium Hydroxide, Tech.—See Caustic Soda.				
Sodium Hypochlorite C.P., Solution $NaOCl$ M.W. 74.45	....	....	**.44**	**.28**
Sodium Hypochlorite, (Liquid Bleach) 5-lb. bottle, **$ .70 ea.;** 1 gal., **$ .85 gal.;** 13-gal. carboy, **$ .40 gal.****	....	....	**.25**	....
Sodium Hypophosphite C.P., Cryst. $NaH_2PO_2.H_2O$ M.W. 106.07	....	**$ .65**	**1.95**	....
Sodium Hypophosphite, NF, Cryst.	....	....	**1.14**	**1.08**
Sodium Hyposulphite, Photo, Bulk (Pea Crystals) $Na_2S_2O_3.5H_2O$ M.W. 248.19 10 lbs., **$ .07 lb.;** 25 lbs., **$ .06 lb.;** 50 lbs., **$ .05 lb.;** 100 lbs., **$ .04¾ lb.**	....	....	**.10**	....
Sodium Hyposulphite—See Sodium Thiosulphate.				
Sodium Iodate C.P., Powd. $NaIO_3$ M.W. 197.93	**$ .65**	**2.17**	**6.99**	**6.94**
Sodium Iodate, Purified, Powd.	....	**1.46**	**5.54**	**5.47**
Sodium Iodide C.P. NaI M.W. 149.93 25-lb. jar, **$3.57 lb.**	**.43**	**1.35**	**4.26**	**4.21**
Sodium Iodide U.S.P.	**.26**	**.74**	**2.70**	**2.65**
Sodium Lactate, Liquid, About 50%	....	....	**.85**	....
Sodium Meta Bisulphite, Gran. (Pyrosulphite) $Na_2S_2O_5+7H_2O$ M.W. 316.23	....	**.20**	**.48**	**.42**
Sodium Metaphosphate, Purified $NaPO_3$ M.W. 102.04	....	**.55**	**1.57**	....
Sodium Metasilicate (Metso) 9-lb. cans, **$ .09 lb.;** 50-lb. keg, **$ .07 lb.;** 100-lb. keg, **$ .05½ lb.;** 300-lb. bbl., **$ .04 lb.**	....	....	**.20**	....
Sodium Molybdate C.P. $Na_2MoO_4.2H_2O$ M.W. 242.03	**.26**	**.77**	**2.31**	**2.26**
Sodium Monosulphide—See Sodium Sulphide.				
Sodium Nitrate C.P., Cryst. ACS $NaNO_3$ M.W. 85.01 25-lb. keg, **$ .28 lb.**	....	**.22**	**.49**	**.44**
Sodium Nitrate C.P., Sticks	....	**.39**	**.96**	**.91**
Sodium Nitrate U.S.P., Cryst. (Chile Saltpetre)	....	....	**.20**	**.17**
Sodium Nitrate U.S.P., Powd.	....	....	**.35**	**.33**
Sodium Nitrate, Pure, Gran., Bulk 10 lbs., **$ .09 lb.;** 25 lbs., **$ .08 lb.;** 100 lbs., **$ .06 lb.;** 500 lbs., **$ .05 lb.**	....	....	**.10**	....
Sodium Nitrite C.P., Cryst. ACS $NaNO_2$ M.W 69.01	....	**.26**	**.65**	**.60**
Sodium Nitrite C.P., Sticks	....	**.43**	**1.20**	**1.14**
Sodium Nitrite U.S.P., Sticks	**.18**	**.35**	**1.12**	**1.07**
Sodium Nitrite U.S.P., Gran.	....	**.18**	**.44**	**.39**
Sodium Nitrite, Com'l., Bulk 10. lbs., **$ .16 lb.;** 25 lbs., **$ .15 lb.;** 140-lb. keg, **$ .13 lb.;** 425-lb. bbls., **$ .12 lb.**	....	....	**.20**	**.17**
Sodium Nitroferricyanide C.P., Cryst. (Sodium Nitroprusside) $Na_2Fe(CN)_5(NO).2H_2O$ M.W. 297.95	**.43**	**1.38**	**4.36**	**4.30**
Sodium Oleate, Neutral, Powd.	**.16**	**.28**	**.82**	....
Sodium Oleate, Flotation Grade, Bulk 10 lbs., **$ .17 lb.;** 25 lbs., **$ .16 lb.;** 100-lb. drum, **$ .14 lb.**				
Sodium Oxalate C.P., Powd. $Na_2C_2O_4$ M.W. 133.99 25-lb. keg, **$1.08 lb.**	**.26**	**.49**	**1.43**	**1.38**
Sodium Oxalate C.P., Spec., Powd. ACS (For Standardizing according to Sorrenson)	**.27**	**.78**	**2.37**	**2.31**
Sodium Oxalate, Tech., Powd.	....	....	**.73**	**.68**
Sodium Perborate C.P., Powd. $NaBo_3.4H_2O$ M.W. 153.88	**.13**	**.26**	**.65**	**.60**
Sodium Perborate U.S.P., Powd.	....	**.14**	**.39**	**.36**
Sodium Periodate C.P., (Meta) $NaIO_4$ M.W. 213.92	**2.07**	**7.28**	**24.04**	....
Sodium Peroxide C.P. ACS Na_2O_2 M.W. 77.99 25-lb. can, **$ .53 lb.**	**.17**	**.30**	**.75**	**.70**
Sodium Peroxide C.P., Special ACS (Calorific Grade—Low in S and SiO_2)	....	**.51**	**1.50**	**1.46**
Sodium Peroxide, Purified, Powd.	....	**.22**	**.62**	....
Sodium Phenolsulphonate—See Sulphocarbolate.				
Sodium Phosphate C.P., Secondary, Cryst. ACS (Disodium) $Na_2HPO_4.12H_2O$ M.W. 358.23 25-lb. keg, **$ .30 lb.**	....	**.22**	**.52**	**.47**
Sodium Phosphate C.P., Secondary, Dried Powd. (Disodium)	....	**.57**	**1.70**	**1.66**
Sodium Phosphate C.P., Primary, Cryst. (Dihydrogen) $NaH_2PO_4.H_2O$ M.W. 138.06	**.22**	**.29**	**.73**	**.68**
Sodium Phosphate C.P., Tertiary, Cryst. (Trisodium) $Na_3PO_4.12H_2O$ M.W. 380.23 25-lb. keg, **$ .52 lb.**	....	**.30**	**.77**	**.72**
Sodium Phosphate U.S.P., Primary, Gran. (Dihydrogen)	....	**.20**	**.51**	**.46**
Sodium Phosphate U.S.P., Secondary, Gran. (Disodium)	....	....	**.27**	**.23**
Sodium Phosphate U.S.P., Secondary, Dried Powd. (Disodium)	....	**.57**	**1.70**	**1.66**
Sodium Phosphate, Tech., Secondary, Gran.	....	....	**.21**	....
Sodium Phosphate, Purified, Tertiary, Cryst. (Trisodium)	....	....	**.60**	....
Sodium Phosphate, Tech., Tertiary, Cryst.	....	....	**.29**	**.22**
Sodium Phosphite $Na_2HPO_3.5H_2O$ M.W. 216.13	**.36**	**1.11**	**4.16**	**4.11**
Sodium Potassium Carbonate C.P., Powd. (1:2 Fusion Mixture)	**.17**	**.36**	**.87**	**.82**
Sodium Potassium Tartrate—See Potassium Sodium Tartrate.				
Sodium Prussiate, Yellow—See Sodium Ferrocyanide.				
Sodium Pyrophosphate C.P., Cryst. $Na_4P_2O_7.10H_2O$ M.W. 446.20 25-lb. keg, **$ .47 lb.**	....	**.29**	**.72**	**.66**
Sodium Pyrophosphate C.P., Anhyd. Powd. $Na_4P_2O_7$ M.W. 266.08	**.29**	**.79**	**2.31**	**2.26**
Sodium Pyrophosphate U.S.P., Cryst.	....	....	**.57**	**.53**
Sodium Pyrophosphate, Tech., Dry Powd.	....	....	**.52**	....
Sodium Pyrosulphate—See Sodium Bisulphate, Fused.				
Sodium Pyrosulphite—See Sodium Meta Bisulphite.				
Sodium Salicylate C.P. $OH.C_6H_4.COONa$ M.W. 160.04	....	**.44**	**1.21**	**1.12**
Sodium Salicylate U.S.P., Powd. or Cryst.	....	....	**.82**	**.79**
Sodium Silicate C.P., Cryst. (Meta) $Na_2SiO_3.9H_2O$ M.W. 284.24 25-lb. keg, **$1.07 lb.**	**.29**	**.49**	**1.42**	**1.37**
Sodium Silicate, 40 Be, Bulk, (13 lbs. per gal.) 1 gal., **$ .75 gal.;** 5 gals., **$ .60 gal.;** 650-lb. drum, **$2.50 cwt.******				

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*Case and bottles $5.50 extra and returnable.

***Case and bottles included.

**Carboy $5.00 extra and returnable.

****Container extra and returnable.

	1 oz. Each	¼ lb. Each	1 lb. Each	5 lbs. Per lb.
Sodium Silicate, Dry Powd. $Na_2SiO_3.9H_2O$ M.W. 284.24	....	....	$ .42	$ .36
Sodium Silicofluoride C.P., Powd. Na_2SiF_6 M.W. 188.05	$ .25	$ .36	.98	.92
Sodium Stannate C.P., Gran. Na_2SnO_3 M.W. 212.70	.39	.79	2.42	2.39
Sodium Stannate, Tech.	....	....	1.08	....
Sodium Stearate U.S.P., Powd. $NaC_{18}H_{35}O_2$ M.W. 306.37	....	.27	.74	....
Sodium Succinate, Gran. $Na_2C_4H_4O_4+6H_2O$ M.W. 270.15	.18	.36	1.14	1.09
Sodium Sulphate C.P., Cryst. $Na_2SO_4.10H_2O$ M.W. 322.22	....	.23	.56	.51
Sodium Sulphate C.P., Anhyd. Powd. Na_2SO_4 M.W. 142.06 25-lb. keg, **$ .23 lb.**	....	.20	.44	.39
Sodium Sulphate C.P., Spec., Anhyd. Powd. ACS (For Nitrogen Determination) 25-lb. keg, **$ .33 lb.**	....	....	.56	.51
Sodium Sulphate U.S.P., Cryst. or Gran.	....	....	.31	.27
Sodium Sulphate, NF, Powd. (Exsic.)	....	....	.27	.23
Sodium Sulphate, Tech., (Low in Nitrogen)	....	....	.27	.22
Sodium Sulphate, Gran., Bulk (Glaubers Salts) 10 lbs., **$ .08 lb.**; 25 lbs., **$ .07 lb.**; 50 lbs., **$ .06 lb.**; 100 lbs., **$ .04 lb.**; 300-lb. bbls., **$ .03 lb.**	....	....	.09	....
Sodium Sulphate, Anhyd., 98%, Bulk 150-lb. bags, **$ .04 lb.**; 475-lb. bbls., **$ .04½ lb.**				
Sodium Sulphide C.P., Cryst. ACS $Na_2S.9H_2O$ M.W. 240.20 25-lb. jar, **$ .42 lb.**	....	.29	.74	.69
Sodium Sulphide, Purified, White, Cryst. (For photography)	....	....	.57	.52
Sodium Sulphide, Flake, 60-62% 25 lbs., **$ .12 lb.**; 50 lbs., **$ .11 lb.**; 100 lbs., **$ .10 lb.**; 375-lb. drums, **$ .06 lb.**				
Sodium Sulphite C.P., Cryst. $Na_2SO_3.7H_2O$ M.W. 252.17 25-lb. can, **$ .29 lb.**	....	.21	.51	.46
Sodium Sulphite C.P., Spec. ACS (Low in Fe, As, Free Alkali)	.20	.27	.61	.56
Sodium Sulphite U.S.P., Cryst.	....	....	.29	.25
Sodium Sulphite C.P., Anhyd. Powd. ACS Na_2SO_3 M.W. 126.06 25-lb. can, **$ .29 lb.**	....	.22	.51	.46
Sodium Sulphite, Anhyd., Photo 25-lb. drum, **$ .13 lb.**	....	....	.20	.17
Sodium Sulphite, Anhyd., 93%, Gran. (Santosite) 25 lbs., **$10.00 cwt.**; 100-lb. can, **$8.00 cwt.**; 400-lb. bbl., **$5.50 cwt.**				
Sodium Sulphocarbolate U.S.P., Powd. (Sodium Phenolsulphonate) $C_6H_4OH.SO_2ONa+2H_2O$ M.W. 232.16	....	....	.64	.59
Sodium Tartrate C.P., Cryst. $Na_2C_4H_4O_6.2H_2O$ M.W. 230.06	.17	.38	1.03	.98
Sodium Tartrate, Purified	....	....	.98	....
Sodium Thiocyanate C.P., Cryst. (Sodium Sulphocyanide or Sulphocyanate) NaSCN. M.W. 81.07 25-lb. jar, **$1.14 lb.**	.20	.51	1.47	1.42
Sodium Thiocyanate, NF, Cryst. (Sodium Sulphocyanate)	....	.34	1.05	1.00
Sodium Thiocyanate, Tech., Cryst. (Sodium Sulphocyanate)	....	....	.94	.88
Sodium Thiosulphate C.P., Cryst. ACS $Na_2S_2O_3.5H_2O$ M.W. 248.2 25-lb. keg, **$ .32 lb.**	....	.23	.55	.49
Sodium Thiosulphate C.P., Dried Powd. $Na_2S_2O_3$ M.W. 158.12	....	.35	.94	.88
Sodium Thiosulphate, Dried Powd. (Sodium Hyposulphite)	....	....	.64	.59
Sodium Thiosulphate, Pea Cryst. (Sodium Hyposulphite) (For photography)	....	....	.16	.13
Sodium Thiosulphate U.S.P., Gran.	....	....	.33	.30
Sodium Tungstate C.P. $Na_2Wo_4.2H_2O$ M.W. 330.032 25-lb. can, **$2.45 lb.**	.31	.96	3.00	2.95
Sodium Tungstate C.P., Special (According to Dr. Folin)	.44	1.42	4.50	4.45
Sodium Tungstate, Tech., Cryst.	....	....	1.91	1.89
Spirit Ethyl Nitrite U.S.P. (Spirit of Nitrous Ether) 4 lbs., **$1.68 lb.**	....	.53	1.75	....
Standard Solutions—See Page 435.				
Stannic Chloride C.P., Cryst. $SnCl_4.5H_2O$ M.W. 350.62 25-lb. jar, **$ .79 lb.**	.27	.51	1.27	1.08
Stannic Chloride, Cryst.	....	....	1.13	....
Stannic Chloride C.P., Anhyd. (Fuming) $SnCl_4$ M.W. 260.54	.51	.64	1.51	1.31
Stannic Chloride, Tech., Anhyd. (Fuming)	....	....	1.13	.94
Stannic Oxide C.P., Powd. SnO_2 M.W. 150.7 25-lb. keg, **$1.08 lb.**	.35	.47	1.35	1.30
Stannous Chloride C.P., Cryst. ACS $SnCl_2.2H_2O$ M.W. 225.65	.17	.43	1.22	1.17
Stannous Chloride C.P., Fine Cryst. 25-lb. jar, **$ .92 lb.**	....	....	1.22	....
Stannous Chloride, Recryst.	....	.36	.98	.92
Stannous Chloride, Tech. (Tin Crystals)	....	....	.75	.70
Stannous Oxide C.P., Powd. SnO M.W. 134.70	....	.98	3.07	3.02
Stannous Sulphide C.P., Powd. SnS M.W. 150.76 25-lb. can, **$3.22 lb.**	....	1.18	3.76	3.71
Starch C.P., Soluble, Powd.	....	.38	1.00	.95
Starch, Soluble, Purified, Powd.	....	....	.31	.29
Starch, Arrow Root, Powd.	....	.26	.43	....
Starch, Corn, U.S.P., Powd.	....	....	.18	.16
Starch, Iodized, Powd.	.32	.69	2.43	....
Starch, Potato, Powd.	....	....	.31	.29
Starch, Wheat, Powd.	....	.21	.37	.35
Strontium Acetate C.P., Cryst. $Sr(CH_3COO)_2.\frac{1}{2}H_2O$ M.W. 214.69	....	.69	2,08	2.03
Strontium Bromide C.P., Cryst. $SrBr_2.6H_2O$ M.W. 355.57	....	.43	1.17	....
Strontium Bromide, NF, Cryst.	.16	.31	.94	.88
Strontium Carbonate C.P., Powd. $SrCO_3$ M.W. 147.63 25-lb. keg, **$ .85 lb.**	....	.42	1.17	1.12
Strontium Carbonate, Tech., Powd.	....	....	.52	....
Strontium Chloride C.P., Cryst. $SrCl_2.6H_2O$ M.W. 266.646	.13	.31	.81	.75
Strontium Chloride, Purified, Cryst.	....	.26	.53	....
Strontium Fluoride C.P., Powd. SrF_2 M.W. 125.63	....	.45	1.33	1.28
Strontium Hydroxide C.P., Cryst. $Sr(OH)_2.8H_2O$ M.W. 265.77	....	.61	1.72	1.66
Strontium Hydroxide, Tech.	....	....	.74	....
Strontium Iodide U.S.P. SrI_2+6H_2O M.W. 449.57	.35	1.05	3.90	3.78
Strontium Lactate $Sr(C_3H_5O_3)_2+3H_2O$ M.W. 319.79	.22	.54	1.86	1.81
Strontium Nitrate C.P., Cryst. $Sr(NO_3)_2$ M.W. 211.65 25-lb. keg, **$1.04 lb.**	.18	.48	1.38	1.33

*Case and bottles $5.50 extra and returnable.

**Carboy $5.00 extra and returnable.

***Case and bottles included.

****Container extra and returnable.

	1 oz. Each	¼ lb. Each	1 lb. Each	5 lbs. Per lb.
Strontium Nitrate C.P., Special, Cryst. (Low in Barium)	....	$ .57	$1.70	$1.65
Strontium Nitrate, Pure, Cryst.	....	.23	.64	.59
Strontium Nitrate, Tech., Cryst.	....	....	.40	.38
Strontium Oxalate C.P., Powd. $SrC_2O_4.H_2O$ M.W. 193.66	....	.74	2.12	....
Strontium Peroxide SrO_2 M.W. 119.63	$ .30	.81	2.93	2.60
Strontium Phosphate C.P., Powd. $Sr_3(PO_4)_2$ M.W. 452.97	....	.70	2.05	....
Strontium Salicylate, NF $Sr(C_7H_5O_3)_2+2H_2O$ M.W. 397.81	....	.49	1.65	1.57
Strontium Sulphate C.P., Powd. $SrSO_4$ M.W. 183.69	.21	.56	1.61	1.55
Strontium Sulphide, Powd. SrS M.W. 119.69	....	.34	1.08	1.01
Sucrose C.P., Cryst. $C_{12}H_{22}O_{11}$ M.W. 342.18	....	.27	.68	.62
Sucrose U.S.P.	....	....	.60	....
Sugar of Lead—See Lead Acetate.				
Sugar of Milk—See Lactose.				
Sulfanilamide, N. N. R., Coarse Powd. (Para-Aminobenzene-Sulfonamide)	.33	.75	2.67	....
Sulphur, Precip., U.S.P., Powd. S At. Wt. 32.06	....	....	.47	.44
Sulphur, Flowers, (Sublimed Sulphur)	....	....	.12	.10
Sulphur, Powd., (Flour Sulphur), Bulk 10 lbs., $ **.06 lb.;** 25 lbs., $ **.05 lb.;** 100-lb. bags, $ **.04 lb.**	....	....	.08	....
Sulphur Chloride, Liquid (Sulphur Monochloride) SCl M.W. 67.52	....	....	.66	.43
Sulphur Dioxide—See Gases, Page 191.				
Sulphur Dioxide, Refrigeration Grade 25-lb. cylinders, $ **.21 lb.******; 150-lb. cylinders, $ **.16 lb.******				
Sulphuric Ether—See Ether.				
Talc (Talcum), Purified, Powd. (Exceeds U.S.P. in Soluble Substances)	....	....	.21	.18
Talc, Powd., (Soapstone), Bulk 10 lbs., $ **.08 lb.;** 25 lbs., $ **.07 lb.;** 50 lbs., $ **.06 lb.;** 100 lbs., $ **.05 lb.;** 200 lbs., $ **.04½ lb.**	....	....	.15	.12
Tannin—See Acid, Tannic.				
Tartar Emetic—See Antimony and Potassium Tartrate.				
Terpin Hydrate U.S.P., Cryst. $C_6H_8(OH)_2(CH_3)(C_3H_7)+H_2O$ M.W. 190.23	.12	.24	.78	....
Terpin Hydrate U.S.P., Powd.	....	.12	.25	.79
Test Lead—See Lead Metal.				
Thermit, Black, Powd.	....	.29	.79	....
Thiocarbanalid, Bulk, (For Flotation T & T Mixture) 25 lbs., $ **.48 lb.;** 50 lbs., $ **.44 lb.;** 100 lbs., $ **.38 lb.;** 250-lb. drum, $ **.34 lb.**				
Thorium Nitrate C.P., Cryst. $Th(NO_3)_4.4H_2O$ M.W. 552.25	.61	2.00	6.45	....
Thymol U.S.P., Cryst.	.27	.74	2.67	2.60
Thymol Iodide U.S.P., Powd.	.44	1.31	4.91	4.75
Tin Metal, Foil Sn At. Wt. 118.7	.21	.49	1.64	....
Tin Metal C.P., Mossy or Shot 25-lb. can, **$1.41 lb.**	....	.61	1.81	1.74
Tin Metal, Shot or Mossy	....	.42	1.46	1.42
Tin Metal C.P., Powd. (20 and 30 mesh—Specify Which)	....	.65	1.94	1.89
Tin Metal, Powd. 20 mesh 25-lb. can, **$1.12 lb.**	....	.42	1.47	....
Tin Metal C.P., Sticks 25-lb. box, **$1.43 lb.**	....	.59	1.82	1.76
Tin Metal, Sticks	....	.44	1.55	1.51
Tin Bichloride—See Stannic Chloride, Fuming.				
Tin Crystals—See Stannous Chloride, Tech.				
Tin Dioxide—See Stannic Oxide.				
Tin Monoxide—See Stannous Oxide.				
Tin Protochloride—See Stannous Chloride.				
Tin Protoxide—See Stannous Oxide.				
Tin Tetrachloride—See Stannic Chloride.				
Titanium Oxide, Purified (Dioxide) TiO_2 M.W. 80.10	....	....	.87	....
Titanium Potassium Oxalate, Purified, Powd. $TiO:(COO.COOK)_2.2H_2O$ M.W. 354.35	.22	.56	1.56	....
Tolidine Ortho C.P., Powd	.75	....	....	....
Toluene C.P. ACS (Toluol) $C_6H_5.CH_3$ M.W. 92.06 25-lb. demj., $ **.25 lb.**	....	.22	.51	.46
Toluene, (Toluol), Purified 1-gal. can, **$1.24 gal.;** 5-gal. can, $ **.85 gal.**	....	....	.29	.23
Toluol, Industrial, Pure, Bulk (7.25 lbs. per gal.) 1 gal., **$1.15 gal.;** 5 gals., $ **.90 gal.;** 10 gals., $ **.80 gal.;** 25 gals., $ **.70 gal.;** 50 gals., $ **.51 gal.******				
Toluidine, Ortho, Flotation Grade (8.4 lbs. per gal.) 1 gal., **$4.50 gal.;** 5 gals., **$3.25 gal.;** 10 gals., **$3.50 gal.**				
Triethanolamine	....	....	.70	.62
Tri-Nitrophenol—See Acid Picric.				
Tri-Sodium Phosphate, Bulk 10 lbs., $ **.08 lb.;** 25 lbs., $ **.07 lb.;** 50 lbs., $ **.06 lb.;** 125-lb. keg, **$5.00 cwt.;** 325-lb. bbl., **$4.50 cwt.**	....	....	.10	.09
TSP—See Tri-Sodium Phosphate.				
Tungsten Trioxide—See Acid Tungstic.				
Turkey Red Oil	....	....	.52	....
Turmeric, Powd.	....	.22	.47	....
Turpentine, Pure, Gum Spirits	....	....	.35	....
Turpentine, Bulk (7 lbs. per gal.) 1-gal. can, **$1.55 gal.;** 5-gal. can, **$1.10 gal.**				
Uranium Acetate C.P. (Uranyl Acetate) $(CH_3COO)_2UO_2.2H_2O$ M.W. 424.26	.60	1.99	6.40	6.34
Uranium Nitrate C.P., Cryst. (Uranyl Nitrate) $UO_2(NO_3)_2.6H_2O$ M.W. 502.28	.49	1.63	5.17	5.12
Uranium Nitrate C.P., Special, Cryst. ACS (Low in Heavy Metals)	.62	1.72	5.28	....
Uranium Nitrate U.S.P., Cryst. $UO_2(NO_3)_2.6H_2O$ M.W. 502.28	....	1.11	3.84	3.68
Urea C.P., Cryst. $CO(NH_2)_2$ M.W. 60.05 25-lb. keg, $ **.90 lb.**	.29	.42	1.16	1.11
Urea, Purified, Cryst.	....	....	.42	.35

*Case and bottles $5.50 extra and returnable.

**Carboy $5.00 extra and returnable.

***Case and bottles included.

****Container extra and returnable.

	1 oz. Each	¼ lb. Each	1 lb. Each	5 lbs. Per lb.
Vanadium Pentoxide, Pure	$ .29	$ .89	$3.18	....
Vaseline, Yellow	....	....	.35	$ .25
Vermillion—See Mercuric Sulphide Red.				
Water, Distilled 5-gal. bottle, **$ .20 gal.******				
Water Glass—See Sodium Silicate Solution.				
Wax, Bees'	....	....	.59	.56
Wax, Carnauba	....	....	.77	....
Wax, Ceresin, White	....	....	.40	....
Wax, Paraffine, Tech., (Parawax)	....	....	.15	....
Wax, Paraffine, White, Solid (M.P. 48-50 and 60-68—Specify which)	....	....	.54	....
Wax, Paraffine, White, Solid (M.P. 50-52, 52-54, and 56-58—Specify which)	....	....	.23	....
Wax, Red Sealing 10 lbs., **$ .10 lb.**	....	....	.35	.25
White Arsenic—See Acid Arsenious.				
White Lead—See Lead Carbonate.				
White Precipitate—See Mercuric Chloride Ammoniated.				
White Vitriol—See Zinc Sulphate.				
Wijs Solution (Certified for Shellac Analysis)	....	....	1.83	1.64
Wood Alcohol—See Alcohol, Methylic.				
Wood's Alloy—See Metal, Wood's Alloy.				
Xanthates, Flotation Grade:				
Z3, Potassium Ethyl Xanthate 10 lbs., **$30.00 cwt.;** 25 lbs., **$25.00 cwt.;** 50-lb. drum, **$21.00 cwt.;** 100 lb. drum, **$20.50 cwt.** 250-lb. drum, **$19.30 cwt.**				
Z4, Sodium Ethyl Xanthate Same price as Z3 above.				
Z5, Potassium Amyl Xanthate (Di-Ethyl Carbinol) 10 lbs., **$60.00 cwt.;** 25 lbs., **$50.00 cwt.;** 50-lb. drum, **$36.00 cwt.;** 100-lb. drum, **$35.00 cwt.** 250-lb. drum, **$34.00 cwt.**				
Z6, Potassium Pentasol Xanthate Same price as Z5 above.				
Z8, Potassium Butyl Xanthate 50-lb. drum, **$32.00 cwt.;** 100-lb. drum, **$31.00 cwt.;** 250-lb. drum, **$30.00 cwt.**				
Yellow Precipitate—See Mercuric Oxide Yellow.				
Zeolite, Green Sand Natural; Grain Exchange 3200, (92 lb. per cu. ft.) **$7.48 cu. ft.**				
Zeolite, Synthetic; Grain Exchange 12000 (50 lbs. per cu. f .) **$15.00 cu.ft.**				
Zinc Metal C.P., Gran., 10 Mesh ACS (Low in As, Pb and Fe) Zn At. Wt. 65.38 25-lb. can, **$ .55 lb.**	....	.31	.81	.75
Zinc Metal C.P., Gran., 20 Mesh ACS (Low in As, Pb and Fe) 25-lb. can, **$ .55 lb.**	....	.31	.81	.75
Zinc Metal C.P., Gran., 30 Mesh ACS (Low in As, Pb and Fe) 25-lb. can, **$ .55 lb.**	....	.31	.81	.75
Zinc Metal C.P., Gran., 40 Mesh ACS (Low in As, Pb and Fe)	....	.31	.81	.75
Zinc Metal, Gran., 80 Mesh	....	.29	.81	.78
Zinc Metal C.P., Mossy ACS (Low in As, Pb nad Fe) 25-lb. keg, **$ .47 lb.**	....	.29	.72	.65
Zinc Metal, Mossy, Purified	....	....	.47	.43
Zinc Metal C.P., Shot ACS (Low in As, Pb and Fe). 25-lb. can, **$ .47 lb.**	....	.29	.72	.65
Zinc Metal, Shot	....	....	.47	.43
Zinc Metal C.P., Sticks ACS (Low in As, Pb and Fe) 25-lb. box, **$ .56 lb.**	....	.26	.72	.68
Zinc Metal, Mossy, Bulk 10 lbs., **$ .19 lb.;** 25 lbs., **$ .17 lb.;** 50 lbs., **$ .15 lb.** 100 lbs., **$ .14 lb.**	....	....	.20	....
Zinc Metal, Foil	....	.47	1.56	....
Zinc Metal, Sheet, 6½x½-inch strips (For standardizing)	....	.39	1.14	....
Zinc Metal C.P., Turnings, ACS (Low in As)	....	....	1.39	....
Zinc Dust, Bulk, (For gold precipitation from cyanide solution) 10 lbs., **$ .17 lb.;** 25 lbs., **$ .16 lb.;** 50 lbs., **$ .15 lb.;** 100 lbs., **$ .13 lb.;** 500 lbs., **$ .12 lb.;** 1000 lbs., **$ .11½ lb.;** 2000 lbs., **$ .11 lb.**	....	....	.20	.18
Zinc Acetate C.P., Cryst. $Zn(CH_3COO).2H_2O$ M.W. 219.47 25-lb. keg, **$ .55 lb.**	.25	.31	.81	.75
Zinc Acetate U.S.P., Cryst.	....	.20	.57	.55
Zinc Acetate, Tech., Cryst.	....	....	.49	....
Zinc Ammonium Chloride, Tech.	....	....	.55	....
Zinc Borate	.20	.41	1.33	....
Zinc Bromide C.P., Cryst. $ZnBr_2$ M.W. 225.21	....	.82	2.34	2.29
Zinc Bromide, Purified, Cryst.	....	....	1.51	1.31
Zinc Carbonate C.P., Powd.	....	.47	1.33	1.27
Zinc Carbonate U.S.P., Powd.	....	.21	.62	.60
Zinc Carbonate, Tech.	....	....	.48	.46
Zinc Chloride C.P., Gran. ACS $ZnCl_2$ M.W. 136.29 25-lb. jar, **$ .41 lb.**	....	.26	.62	.57
Zinc Chloride U.S.P., Gran.	.13	.21	.53	.48
Zinc Chloride C.P., Stick	....	.42	1.17	1.12
Zinc Chloride U.S.P., Fused, Stick	....	....	.86	.81
Zinc Chloride, Gran., Bulk 10 lbs., **$ .23 lb.;** 25 lbs., **$ .21 lb.;** 50 lbs., **$ .19 lb.;** 100 lbs., **$ .18 lb.**	....	....	.25	....
Zinc Chromate C.P., Powd.	.26	.61	1.73	....
Zinc Cyanide $Zn(CN)_2$ M.W. 117.40	....	.25	.73	.65
Zinc Iodide, NF ZnI_2 M.W. 319.21	.57	1.59	5.82	5.64
Zinc Nitrate C.P., Cryst. $Zn(NO_3)_2.6H_2O$	....	.31	.82	.77
Zinc Nitrate, Purified, Cryst.	....	.24	.66	.61

*Case and bottles $5.50 extra and returnable.

**Carboy $5.00 extra and returnable.

***Case and bottles included.

****Container extra and returnable.

	1 oz. Each	¼ lb. Each	1 lb. Each	5 lbs. Per lb.
Zinc Nitrate, Tech.	....	....	$ .44	$ .39
Zinc Oxalate C.P., Powd. $ZnC_2O_4.2H_2O$ M.W. 189.41	....	$ .69	1.98	....
Zinc Oxide C.P., Powd., (Dry Process) ZnO M.W. 81.38 25-lb. keg, $ **.40 lb.**	....	.26	.64	.59
Zinc Oxide C.P., Powd., (Wet Process) 25-lb. keg, $ **.60 lb.**	....	.33	.86	.81
Zinc Oxide U.S.P. (Dry Process)	....	....	.39	.36
Zinc Oxide, White, Tech.	....	....	.31	.29
Zinc Permanganate $Zn(MnO_4)_2+6H_2O$ M.W. 411.33	$ .51	1.31	4.72	4.54
Zinc Peroxide	.23	.64	2.25	1.95
Zinc Phosphate $Zn_3(PO_4)_2$ M.W. 386.19	.16	.35	1.22	1.20
Zinc Phosphide Zn_3P_2 M.W. 258.19	.21	.43	1.44	1.26
Zinc Stearate U.S.P., Powd. $Zn(C_{18}H_{35}O_2)_2$ M.W. 631.11	....	....	.57	.49
Zinc Sulphate C.P., Cryst. ACS $ZnSO_4.7H_2O$ M.W. 287.56	....	.21	.48	.43
Zinc Sulphate C.P., Dried Powd. $ZnSO_4.H_2O$ M.W. 179.46 25-lb. keg, $ **.41 lb.**	....	.26	.65	.60
Zinc Sulphate U.S.P., Gran.	....	....	.35	.31
Zinc Sulphate, Dried, Purified	....	....	.39	.36
Zinc Sulphate, Gran. (25½% Zinc Content), Bulk, 10 lbs., $ **.12 lb.**; 25 lbs., $ **.09 lb.**; 50 lbs., $ **.07 lb.**; 100-lb. bag, $ **.05 lb.**; 2000 lbs., **$4.35 cwt.**	....	....	.12	....
Zinc Sulphide, Powd.	.49	.87	2.68	....
Zinc Sulphite $ZnSO_3.2H_2O$ M.W. 181.46	.22	.52	1.79	1.73
Zinc Sulphocarbolate, NF, Powd. (Zinc Phenolsulphonate) 25-lb. drum, $ **.36 lb.**	.13	.23	.61	.56
Zinc Valerate U.S.P., Powd. $Zn(C_5H_9O_2)_2+2H_2O$ M.W. 303.60	.46	1.44	5.46	5.40

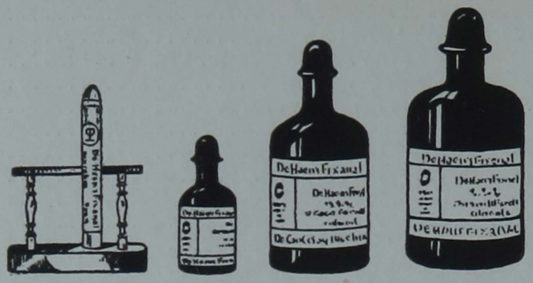
*Case and bottles $5.50 extra and returnable.
**Carboy $5.00 extra and returnable.
***Case and bottles included.
****Container extra and returnable.

STANDARD VOLUMETRIC SOLUTIONS

	500 ml. Bottle	1 Liter Bottle
Acid Hydrochloric N/100	$1.00	$1.50
Acid Hydrochloric N/50	1.00	1.50
Acid Hydrochloric N/10	1.00	1.50
Acid Hydrochloric N/2	1.00	1.50
Acid Hydrochloric Normal	1.00	1.50
Acid Nitric N/100	1.00	1.50
Acid Nitric N/50	1.00	1.50
Acid Nitric N/10	1.00	1.50
Acid Nitric Normal	1.00	1.50
Acid Oxalic N/100	1.00	1.50
Acid Oxalic N/50	1.00	1.50
Acid Oxalic N/20	1.00	1.50
Acid Oxalic N/10	1.00	1.50
Acid Sulphuric N/100	1.00	1.50
Acid Sulphuric N/50	1.00	1.50
Acid Sulphuric N/10	1.00	1.50
Acid Sulphuric 2/3 N	1.00	1.50
Acid Sulphuric Normal	1.00	1.50
Alcoholic Potassium Hydroxide N/10	2.00	3.25
Iodine N/100	1.00	1.50
Iodine N/20	1.00	1.50
Iodine N/10	1.00	1.50
Potassium Bichromate N/10	1.00	1.50
Potassium Bichromate N/2	1.00	1.50
Potassium Bichromate Normal	1.00	1.50
Potassium Hydroxide N/100	1.00	1.50
Potassium Hydroxide N/50	1.00	1.50
Potassium Hydroxide N/10	1.00	1.50
Potassium Hydroxide N/2	1.00	1.50
Potassium Hydroxide Normal	1.00	1.50
Potassium Permanganate N/100	1.00	1.50
Potassium Permanganate N/10	1.00	1.50
Potassium Permanganate N/25	1.00	1.50
Potassium Permanganate N/20	1.00	1.50
Potassium Permanganate N/5	1.00	1.50
Silver Nitrate N/10	1.25	2.00
Soap Solution for Water Analysis 1 cc.=.001 Gr. $CaCO_3$	....	2.00
Sodium Arsenite N/50	1.00	1.50
Sodium Arsenite N/10	1.00	1.50
Sodium Carbonate N/10	1.00	1.50
Sodium Chloride N/10	1.00	1.50
Sodium Hydroxide N/100	1.00	1.50
Sodium Hydroxide N/50	1.00	1.50
Sodium Hydroxide N/10	1.00	1.50
Sodium Hydroxide Normal	1.00	1.50
Sodium Thiosulphate N/100	1.00	1.50
Sodium Thiosulphate N/50	1.00	1.50
Sodium Thiosulphate N/10	1.00	1.50

Note: We can supply promptly Standard Solutions other than those listed above upon request.

"Fixanal" Preparations



Preparations for 1/10 Normal Solutions

"Fixanal" Preparations are analytical chemicals, correctly weighed and standardized for volumetric analysis made under scientific control. They are put up in special hermetically sealed tubes, always assuring fresh solutions. They are guaranteed accurate within two parts per thousand.

"Fixanal" Preparations give a solution ready for use in five minutes, saving time and labor. Put up in tubes and packed 5 in a carton. Each tube sufficient for 1 litre of N/10 solution.

Acid Arsenious
Acid Hydrochloric
Acid Oxalic
Acid Sulphuric
Ammonium Sulphocyanide
Potassiium Bichromate
Potassium Bromate
Potassium Hydroxide
Potassium Permanganate
Sodium Arsenite
Sodium Bromate
Sodium Carbonate
Sodium Chloride
Sodium Hydroxide
Sodium Oxalate
Sodium Thiosulphate

436M1 Tube of any chemical listed above	**$ .85**
436M2 Iodine N/10. Tube	**$1.70**
436M3 Silver Nitrate. N/10. Tube	**$2.00**
436M4 Piercing Apparatus. Each	**$1.10**

Preparations for Normal Solutions

Same as above, except supplied in bottle with each bottle sufficient for 1 liter for Normal Solution.

Acid Hydrochloric
Acid Nitric
Acid Sulphuric
Potassium Hydroxide
Sodium Hydroxide

436M5 Bottle	**$1.00**

CHEMICAL INDICATORS, DRY

	1 gm.	10 gm.	25 gm.	100 gm.
Alizarine	....	**$ .75**	**$1.50**	**$5.25**
Alizarine 20% paste; **$ .40 oz.**				
Alizarine Blue S	....	**.75**	**1.50**	**5.25**
Alizarine Green G	....	**.75**	**1.50**	**5.25**
Alizarine mono sulphonate, Ph. Range (3.7-4.2)	....	**.75**	**1.50**	**5.25**
Alizarine Red S	....	**.75**	**1.50**	**5.25**
Alizarine Yellow G	....	**.75**	**1.50**	**5.25**
Alizarine Yellow R, Ph. Range (10.1-12.1)	....	**.75**	**1.50**	**5.25**
Alkali Blue 6B	....	**.75**	**1.50**	**5.25**
Alpha Naphtholphthalein, Ph. Range (7.3-8.7)	**$ .75**	**6.00**	**12.00**	....
A-naphthylamine-azo-sulfanilic acid Ph. Range (3.5-5.7)	....	**1.50**	**3.00**	....
Andrade's Indicator	....	**.75**	**1.50**	**5.25**
Anisole sulfon phthalein, Ph. Range (6-8)	**1.25**	**10.00**	**22.50**	....
Aniline Red—See Fuchsin Basic.				
Azolitmin, Ph. Range (4.5-8.3)	....	**2.50**	**5.00**	....
Benzaldehyde Green	....	**.75**	**1.50**	**5.25**
Benzopurpurin B, Ph. Range (2-4)	....	**.50**	**1.00**	**3.25**
Benzeneazobenzylaniline, Ph. Range (2.3-3.3)	....	**1.50**	**3.00**	....
Benzene-azo-a-naphthylamine, Ph. Range (3-7-5.0)	....	**1.50**	**3.00**	....
Benzene Sulfonic acid azo benzyl aniline, Ph. Range (1.9-3.3)	....	**1.50**	**3.00**	....
Brilliant Yellow, Ph. Range (6-8)	....	**.50**	**1.00**	**3.25**
Bromcresol Purple—See Di bromo ortho cresol sulfon phthalein.				
Brom Phenol Red—See Di brom phenol sulfon phthalein.				
Brom Thymol Blue—See Di bromo thymol sulfon phthalein.				

	1 gm.	10 gm.	25 gm.	100 gm.
Carminic Acid	$ .50	$3.00	$6.00	....
Chlor Phenol Red—See Di chlor phenol sulfon phthalein.				
Cochineal—Powder	....	....	....	$ .50
Congo Corinth G	....	.50	1.00	3.25
Congo Red	....	.35	.75	2.75
Corallin—See Rosolic Acid.				
Corallin Na Salt (Water Soluble)	....	.50	1.00	3.25
Curcumin, Ph. Range (6-8)	....	2.00	4.00	15.25
Di bromo ortho cresol sulfon phthalein (Brom. Cresol Purple) Ph. Range (5.2-6.8)	1.25	10.00	22.50	....
Di bromo thymol sulfon phthalein (Brom Thymol Blue) Ph. Range (6.0-7.6)	1.25	10.00	22.50	....
Di brom phenol sulfon phthalein (Brom Phenol Red)	1.25	10.00	22.50	....
Di chlor phenol sulfon phthalein (Chlor Phenol Red)	2.50	....	....	....
Diethyl amino azo benzol-o-carboxylic acid—See Ethyl Red.				
Dihydroxy-anthraquinone—See Alizarine.				
Dimethyl amino azo benzol-o-carboxylic acid—See Methyl Red Crystals.				
Dimethylamidoazobenzol, Ph. Range (2.9-4.0)	....	.60	1.30	4.55
Dinitro Hydroquinone Diacetate, Ph. Range (4-5 and 9-10)	.50	3.50	....	....
Diphenylamine	....	.30	.50	1.75
Diphenylamidoazobenzene, Ph. Range (1.2-2.1)	....	1.50	3.00	....
Eosin Y	....	.75	1.50	5.25
Erythrosin	....	1.00	2.00	7.25
Ethyl Orange, Ph. Range (2-4)	....	1.00	2.00	7.25
Ethyl Red.	....	2.00	4.00	15.25
Fluorescein (Acid)	....	.75	1.50	5.25
Fluorescein (Na Salt)	....	.75	1.50	5.25
Fuchsin Acid	....	.75	1.50	5.25
Fuchsin Basic—Pure Crystals	....	.75	1.50	5.25
Gallein	....	1.30	2.60	....
Haematoxylin C.P., Ph. Range (5-6)	....	2.50	5.25	18.00
Helianthin—See Methyl Orange.				
Indigo Carmine	....	.75	1.50	5.25
Indigo Sulphonic Acid—See Indigo Carmine.				
Iodo-Eosin, Ph. Range (4-5)	....	1.00	2.00	7.25
Lacmoid	....	.75	1.50	5.25
Litmus Cubes—See Chemicals.				
Litmus Powder—See Chemicals.				
Litmus, Purified	....	.60	1.30	4.55
Litmus—See Azolitmin.				
Magenta—See Fuchsin Basic.				
Malachite Green, Crystals	....	.75	1.50	5.25
Meta-Nitro-benzene-azo-salicylic-acid-Na salt—See Alizarine Yellow G.				
Methyl Orange, Ph. Range (3.1-4.4) 1 oz., **$ .38;** 4 oz., **$1.29;** 1 lb., **$4.82.**				
Methyl Red, Crystals, Ph. Range (4.2-6.3) 1 oz., **$ .88;** 4 oz., **$3.26;** 1 lb., **$11.83.**				
Methyl Violet, Ph. Range (0.1-3.2)	....	.75	1.50	5.25
Metanil Yellow, Ph. Range (1.2-2.3)	....	.75	1.50	5.25
Naphthol Green B	....	.75	1.50	5.25
Neutral Red, Ph. Range (6.8-8.0)	....	.75	1.50	5.25
a-Naphthol Benzein, Ph. Range (0-1) and (8-9)	.50	3.00	....	....
Orange I	....	.50	1.00	3.25
Orange II	....	.50	1.00	3.25
Orange III—See Methyl Orange.				
Orange IV, Ph. Range (1.4-2.6)	....	.75	1.50	5.25
Orange G, Crystals	....	.75	1.50	5.25
Orcein	....	1.00	2.00	7.25
Ortho cresol sulfon phthalein (Cresol Red), Ph. Range (7.2-8.8)	1.25	10.00	22.50	....
Ortho cresol phthalein Ph. Range (8.2-9.8)	.35	2.00	4.00	15.00
Para-nitro-benzene-azo-salicylic acid Na-salt—See Alizarine Yellow R.				
Para Nitro Phenol Ph. Range (5.0-7.0)		.30	.50	1.75
Patent Blue L	....	.75	1.50	5.25
Phenacetolin	....	1.00	2.00	7.25
Phenolphthalein, Ph. Range (8.3-10)	....	.25	.40	1.40
Phenol sulfon phthalein (Phenol Red), Ph. Range (6.8-8.4)	1.25	10.00	22.50	....
Phenylaniline	....	.30	.50	1.75
Poirrier's Blue	....	.75	1.50	5.25
Propyl Red, Ph. Range (4.8-6.4)	1.00	6.00	12.00	....
Resazurin	.75	5.00	10.00	....
Resorcin Benzein	.50	3.00	....	....
Resorcin phthalein—See Fluorescein, Acid.				
Resolic Acid, Ph. Range (6.9-8.0)	....	.50	1.00	3.25
Riegler's Indicator	....	2.00	4.00	....
Salicylic Acid	....	.25	.40	....
Sive's Red	1.00	6.00	12.00	....
Sodium Indigo Sulfonate, Ph. Range (12-14)	....	.75	1.50	5.25
Sodium Sulphalizarate	....	.75	1.50	5.25
Tetra-brom fluorescein—See Eosin Y.				

	1 gm.	10 gm.	25 gm.	100 gm.
Tetra brom phenol phthalein	....	$1.00	$2.00	$7.25
Tetra brom-m-Cresol Sulfon Phthalein (Brom Cresol Green)	$2.50	....	....	....
Tetra bromo phenol sulfon phthalein (Brom Phenol Blue) Ph. Range (3.0-4.6)	1.25	10.00	22.50	....
Tetra nitro phenol sulfon phthalein, (Ph. Range (9-10)	2.00	....	....	....
Thymol sulfon phthalein (Thymol Blue), Ph. Range (8.0-9.6) (1.2-2.8)	1.25	10.00	22.50	....
Thymolphthalein, Ph. Range (9.3-10.5)	.35	2.00	4.00	....
Toluylene Red—See Neutral Red.				
Trinitro Benzene, Ph. Range (13-14.3)	....	2.00	4.00	14.00
Tropaolin 000 No. 1	....	.50	1.00	3.25
Tropaolin 000 No. 2, Ph. Range (7.6-8.9)	....	.50	1.00	3.25
Tropaolin 0, Ph. Range (11.1-12.7)	....	.75	1.50	5.25
Tropaolin 00, Ph. Range (1.4-2.6)	....	.75	1.50	5.25
Turmeric	....	....	.25	.50

Note: For LaMotte Indicators in solution see Page 214.

HYDROGEN ION INDICATORS

Sorensen's List

	Ph. Range	1 gm.	10 gm.	25 gm.
Methyl Violet	0.1- 3.2	....	$ .75	$1.50
Diphenylamidoazobenzene	1.2- 2.1	....	1.50	3.00
Metanil Yellow	1.2- 2.3	....	.75	1.50
Tropaolin 00	1.4- 2.6	....	.75	1.50
Benzeneazobenzylaniline	2.3- 3.3	....	1.50	3.00
Dimethylamidoazobenzol	2.9- 4.0	....	.60	1.30
Methyl Orange	3.1- 4.4	....	.25	.35
Benzene-azo-a-naphthylamine	3.7- 5.0	....	1.50	3.00
A-naphthylamine-azo-sulfanilic acid	3.5- 5.7	....	1.50	3.00
Methyl Red	4.2- 6.3	....	.50	.85
Para Nitro Phenol	5.0- 7.0	....	....	.50
Azolitmin	4.5- 8.3	....	2.50	5.00
Neutral Red	6.8- 8.0	....	.75	1.50
Rosolic Acid	6.9- 8.0	....	.50	1.00
Alpha Naphtholphthalein	7.3- 8.7	$ .75	6.00	12.00
Tropaolin 000	7.6- 8.9	....	.75	1.50
Phenolphthalein	8.3-10.0	....	....	.40
Thymolphthalein	9.3-10.5	.35	2.00	4.00
Alizarine Yellow R	10.1-12.1	....	.75	1.50
Tropaolin 0	11.1-12.7	....	.75	1.50

BIOLOGICAL STAINS, DRY

	1 gm.	10 gm.	25 gm.	100 gm.	200 gm.
Acetin Blue	....	$ .50	$1.00	$3.25	$6.00
Acid Blue	....	.75	1.50	5.25	9.60
Acid Brown	....	.50	1.00	3.25	6.00
Acid Carminic	$ .50	3.00	6.00	....	....
Acid Fuchsin	....	.75	1.50	5.25	9.60
Acid Green G	....	.75	1.50	5.25	9.60
Acid Magenta	....	.75	1.50	5.25	9.60
Acid Orange	....	.50	1.00	3.25	6.00
Acid Rubin—See Acid Fuchsin.					
Acid Violet	....	.75	1.50	5.25	9.60
Acid Yellow	....	.75	1.50	5.25	9.60
Acridine Orange	....	.75	1.50	5.25	9.60
Acridine Yellow R	....	.75	1.50	5.25	9.60
Aldehyde Green	....	.75	1.50	5.25	9.60
Alizarine	....	.75	1.50	5.25	9.60
Alizarine Blue S	....	.75	1.50	5.25	9.60
Alizarine Green G	....	.75	1.50	5.25	9.60
Alizarine Monosulfonate Sodium	....	.75	1.50	5.25	9.60
Alizarine Red S	....	.75	1.50	5.25	9.60
Alizarine Yellow G	....	.75	1.50	5.25	9.60
Alizarine Yellow R	....	.75	1.50	5.25	9.60
Alkali Blue 6 B	....	.75	1.50	5.25	9.60
Alkali Green D	....	.75	1.50	5.25	9.60
Alum Carmine	....	1.00	2.00	7.25	13.50
Amaranth	....	.50	1.00	3.25	6.00
Amino Azo Benzol	....	.50	1.00	3.25	6.00
Amino Azo Toluol	....	.50	1.00	3.25	6.00
Ammonium Carminate	....	2.00	4.00	....	....
Aniline Blue Black	....	.75	1.50	5.25	9.60
Aniline Blue, Spirit Sol.	....	.75	1.50	5.25	9.60
Aniline Blue, Water Sol.	....	.75	1.50	5.25	9.60
Aniline Green—See Aldehyde Green.					

	1 gm.	10 gm.	25 gm.	100 gm.	200 gm.
Aniline Red—See Fuchsin Basic, Pure Crystals.					
Aniline Violet—See Methyl Violet.					
Aniline Yellow Auramine—See Auramine O.					
Aniline Yellow (Spirit Sol.)	....	$ .75	$1.50	$5.25	$9.60
Aniline Yellow (Water Sol.)	....	.50	1.00	3.25	6.00
Anthracene Green	....	.90	1.80	6.65	....
Archil	....	1.00	2.00	7.25	....
Auramine O	....	.50	1.00	3.25	6.00
Aurin	....	.50	1.00	3.25	6.00
Azo Blue	....	.50	1.00	3.25	6.00
Azo Fuchsin	....	.50	1.00	3.25	6.00
Azophor Red	....	.50	1.00	3.25	6.00
Azo Bordeaux—See Bordeaux Red.					
Azo Rubin	....	.50	1.00	3.25	6.00
Azur I	$1.00	7.00	....	....	....
Azur II	.50	3.50	....	....	....
Azur II, Eosin	1.40	10.50	....	....	....
Azur A (French)	1.00	7.00	....	....	....
Azur A (MacNeal)	1.00	7.00	....	....	....
Azur B (Bromide)	1.00	7.00	....	....	....
Azur C (French)	.50	3.50	....	....	....
Benzaldehyde Green—See Aldehyde Green.					
Benzoazurin	....	.75	1.50	5.25	9.60
Benzopurpurin B	....	.50	1.00	3.25	6.00
Benzopurpurin 4 B	....	.50	1.00	3.25	6.00
Benzopurpurin 10 B	....	.50	1.00	3.25	6.00
Benzoreinblau	....	.50	1.00	3.25	6.00
Benzyl Violet	....	.90	1.80	6.65	....
Berlin Blue	....	.50	1.00	3.25	6.00
Berlin Blue (For Injecting Blood Vessels)	....	.50	1.00	3.25	6.00
Biebrich Blue	....	.75	1.50	5.25	9.60
Biebrich Scarlet (Water Soluble)	....	.75	1.50	5.25	9.60
Bismark Brown Y	....	.50	1.00	3.25	6.00
Blackley Blue—See Soluble Blue.					
Black NBR	....	.50	1.00	3.25	6.00
Bleu Lumiere	....	.75	1.50	5.25	9.60
Bleu de Paris—See Opal Blue.					
Blue Black—See Aniline Blue Black.					
Blue de Lyon O	....	.75	1.50	5.25	9.60
Borax Carmine	....	1.00	2.00	7.25	13.50
Borax Methylene Blue	....	.75	1.50	5.25	9.60
Bordeaux Red	....	.50	1.00	3.25	6.00
Brazilin, C.P.	....	5.00	10.50	....	....
Brilliant Acid Blue	....	.75	1.50	5.25	9.60
Brilliant Alizarine Blue	....	.80	1.60	5.75	10.50
Brilliant Cresyl Blue	.50	3.00	6.00	....	....
Brilliant Green	....	.75	1.50	5.25	9.60
Brilliant Violet 6B	....	.75	1.50	5.25	9.60
Brilliant Yellow	....	.50	1.00	3.25	6.00
Candle Scarlet	....	.75	1.50	5.25	9.60
Carmine	....	.50	1.00	3.25	6.00
Carminate, Ammonium	....	2.00	4.00	....	....
Carminate, Lithium	....	2.00	4.00	....	....
Carminate, Sodium	....	2.00	4.00	....	....
Carminic Acid—See Acid Carminic.					
Carmoisine	....	.60	1.20	4.55	7.80
Capri Blue	.50	2.50	....	....	....
China Blue	....	.75	1.50	5.25	9.60
China Green—See Malachite Green, Crystals.					
Chromogen	....	1.00	2.00	7.25	13.50
Chromotrope	....	.50	1.00	3.25	6.00
Chrome Yellow	....	.35	.75	2.75	....
Chrysamine	....	.50	1.00	3.25	6.00
Chrysoidine R	....	.50	1.00	3.25	6.00
Chrysoidine Y	....	.50	1.00	3.25	6.00
Chrysophenin	....	.50	1.00	3.25	6.00
Cochineal Powder	....	....	....	.50	.80
Coerulein MS	....	.90	1.80	6.65	....
Congo Corinth G	....	.50	1.00	3.25	6.00
Congo Red 4B	....	.35	.75	2.75	5.00
Corallin	....	.50	1.00	3.25	....
Cotton Blue	....	.75	1.50	5.25	9.60
Cresyl Echt Violet, (Cresyl Violet)	....	3.00	6.00	23.25	....
Crocein MOO	....	.60	1.20	4.55	7.80
Crocein Scarlet 7B	....	.60	1.20	4.55	7.80
Crystal Violet	....	.75	1.50	5.25	9.60
Curcumin	....	2.00	4.00	15.25	....

	1 gm.	10 gm.	25 gm.	100 gm.	200 gm.
Cyanosin	....	$1.10	$2.20	$8.00	....
Dahlia B	....	.75	1.50	5.25	$9.60
Diamine Blue 3 B—See Trypan Blue.					
Diamond Blue 3B	....	.75	1.50	5.25	9.60
Diamond Fuchsin—See Fuchsin Basic, Pure Crystals.					
Diamond Green B—See Malachite Green, Crystals.					
Diazine Green	....	1.00	2.00	7.25	13.50
Direct Green G	....	.75	1.50	5.25	9.60
Echt Gelb	....	.75	1.50	5.25	9.60
Eosin, Bluish—Spirit and Water Soluble	....	.75	1.50	5.25	9.60
Eosin, Yellowish—Spirit and Water Soluble	....	.75	1.50	5.25	9.60
Eosin-Methylene Blue	....	2.00	4.00	15.25	....
Eosin (Methyl) Soluble only in alcohol	....	1.50	3.00	....	....
Erie Garnet B	....	.50	1.00	3.25	6.00
Erioglaucine	....	1.50	3.00	11.25	....
Erythrosin	....	1.00	2.00	7.25	13.50
Ethyl Green—See Brilliant Green.					
Ethyl Red	....	2.00	4.00	15.25	....
Ethyl Violet	....	.75	1.50	5.25	9.60
Fast Green FCF	....	2.00	4.00	15.25	....
Fast Red	....	.50	1.00	3.25	6.00
Fast Yellow S	....	.75	1.50	5.25	9.60
Fat Ponceau	....	.75	1.50	5.25	9.60
Fluorescein, Spirit Sol.	....	.75	1.50	5.25	9.60
Fluorescein Na Salt, Water Sol.	....	.75	1.50	5.25	9.60
Fuchsia	....	.75	1.50	5.25	9.60
Fuchsin Acid—See Acid Fuchsin.					
Fuchsin Basic, Pure Crystals	....	.75	1.50	5.25	9.60
Fuchsin S—See Acid Fuchsin.					
Gallein	....	1.30	2.60	....	....
Gallocyanine	....	.60	1.20	4.55	7.80
Garnet R	....	.50	1.00	3.25	6.00
Gentiana Blue 6B	....	.75	1.50	5.25	9.60
Gentian Violet, Improved	....	.75	1.50	5.25	9.60
Gentian Violet, Improved Medicinal	....	1.10	2.50	8.75	16.00
Giemsa's Blood Stain	$1.50	13.00	....	....	....
Gold Orange—See Orange II.					
Green, Acid—See Acid Green G.					
Green, Solid—See Malachite Green, Crystals.					
Haematein Ammonium	....	2.25	5.00	17.50	....
Haematein, Crystals C.P.	....	2.25	5.00	17.50	35.00
Haematoxylin C.P. Crystals	....	2.50	5.25	18.00	....
Haematoxylin, Dark Crystals	....	1.00	2.00	7.25	13.50
Hasting's Stain	.50	2.00	4.00	15.25	....
Helianthin	....	.35	.75	2.75	5.00
Hexamethyl Violet—See Crystal Violet.					
Hofmann's Violet	....	.75	1.50	5.25	9.60
Indigo, Synthetic	....	.75	1.50	5.25	9.60
Indigo Carmine	....	.75	1.50	5.25	9.60
Induline, Spirit Sol.	....	.50	1.00	3.25	6.00
Induline, Water Sol.	....	.50	1.00	3.25	6.00
Iodine Green	....	1.00	2.00	7.25	....
Iodine Violet	....	.75	1.50	5.25	9.60
Iodo eosin	....	1.00	2.00	7.25	13.50
Isamine Blue	....	2.00	4.00	....	....
Janus Black	....	1.00	2.00	7.25	13.50
Janus Blue	....	1.00	2.00	7.25	13.50
Janus Green B	....	1.00	2.00	7.25	13.50
Janus Red	....	1.00	2.00	7.25	13.50
Janus Yellow	....	1.00	2.00	7.25	13.50
Jenner's Stain	....	2.00	4.00	15.25	....
Lauth's Violet	....	2.00	4.00	15.25	....
Lacmoid	....	.75	1.50	5.25	9.60
Leishman's Stain	.50	2.00	4.00	15.25	....
Leuco Brilliant Green	....	.90	1.80	6.65	....
Leuco Magenta	....	.90	1.80	6.65	....
Leuco Malachite Green	....	.90	1.80	6.65	....
Leuco Methyl Violet	....	.90	1.80	6.65	....
Light Green S F	....	.75	1.50	5.25	9.60
Lyon's Blue	....	.75	1.50	5.25	9.60
Magdala Red—See Phloxine Red.					
Magenta Red	....	.75	1.50	5.25	9.60
Malachite Green, Crystals	....	.75	1.50	5.25	9.60
Malachite Green, Hydrochloride	....	.75	1.50	....	....
Martius Yellow	....	.50	1.00	3.25	6.00
May, Greenwald's Stain	....	2.00	4.00	15.25	....
Meldola Blue	....	.90	1.80	6.65	....

	1 gm.	10 gm.	25 gm.	100 gm.	200 gm.
Metanil Orange	....	$ .50	$1.00	$3.25	$6.00
Metanil Yellow	....	.75	1.50	5.25	9.60
Methyl Blue	....	.75	1.50	5.25	9.60
Methyl Green	....	1.00	2.00	7.25	....
Methyl Orange	....	.35	.75	2.75	5.00
Methyl Red—See List of Chemical Indicators.					
Methyl Violet B	....	.50	1.00	3.25	6.00
Methyl Violet 2B	....	.50	1.00	3.25	6.00
Methyl Violet 3B	....	.50	1.00	3.25	6.00
Methyl Violet 4B	....	.50	1.00	3.25	6.00
Methyl Violet 5B	....	.75	1.50	5.25	9.60
Methyl Violet 6B	....	.75	1.50	5.25	9.60
Methyl Violet R	....	.75	1.50	5.25	9.60
Methyl Violet 2R	....	.75	1.50	5.25	9.60
Methyl Violet 3R	....	.75	1.50	5.25	9.60
Methyl Violet 4R	....	.75	1.50	5.25	9.60
Methyl Violet 5R	....	.75	1.50	5.25	9.60
Methylene Azur	$1.00	7.00	....	....	....
Methylene Azur A (MacNeal)	1.00	7.00	....	....	....
Methylene Azur C (French)	.50	3.50	....	....	....
Methylene Blue (For Bacilli)	....	.75	1.50	5.25	9.60
Methylene Blue ,Medicinal	....	.75	1.50	5.25	9.60
Methylene Blue (Rectified for Blood Stains)	....	.75	1.50	5.25	9.60
Methylene Blue-Eosin	....	2.00	4.00	15.25	....
Methylene Green	....	.75	1.50	5.25	9.60
Methylene Violet	....	.75	1.50	5.25	9.60
Methylene Violet (Bernthsen)	....	2.00	4.00	....	....
Mikado Yellow	....	.50	1.00	3.25	6.00
Mimosa	....	.75	1.50	5.25	9.60
Muci-Carmin	....	1.00	2.00	7.25	13.50
Naphthol Green B	....	.75	1.50	5.25	9.60
Naphthol Yellow (Martius Yellow)	....	.50	1.00	3.25	6.00
Naphthol Yellow S	....	.50	3.25	6.00	....
Naphthylamine Brown	....	.50	1.00	3.25	6.00
Naphthylamine Red	....	.50	1.00	3.25	6.00
Naphthylamine Yellow	....	.50	1.00	3.25	6.00
Neutral Red	....	.75	1.50	5.25	9.60
Neutral Red Ehrlich—See Neutral Red.					
Neutral Violet	....	.75	1.50	5.25	9.60
New Methylene Blue N. S. S.	....	.75	1.50	5.25	9.60
New Solid Green 3B	....	.75	1.50	5.25	9.60
Niagara Blue 2 B	....	.75	1.50	5.25	9.60
Niagara Sky Blue 6 B	....	.75	1.50	5.25	9.60
Night Blue	....	1.00	2.00	7.25	13.50
Nigrosine B, Spirit Sol.	....	.50	1.00	3.25	6.00
Nigrosene W S, Water Sol.	....	.50	1.00	3.25	6.00
Nile Blue A—See Nile Blue Sulphate.					
Nile Blue, Hydrochloride	....	3.00	6.00	....	....
Nile Blue, Sulphate	....	3.00	6.00	....	....
Oil Red O—See Sudan IV.					
Opal Blue	....	.75	1.50	5.25	9.60
Orange I	....	.50	1.00	3.25	6.00
Orange II	....	.50	1.00	3.25	6.00
Orange III	....	.35	.75	2.75	5.00
Orange IV	....	.75	1.50	5.25	9.60
Orange G, Crystals	....	.75	1.50	5.25	9.60
Orcein	....	1.00	2.00	7.25	....
Orsielle Extract	....	.75	1.50	5.25	9.60
Para Blue	....	.90	1.80	6.65	....
Para Rosanilin Acetate	....	.75	1.50	5.25	9.60
Para Rosanilin Base	....	.75	1.50	5.25	9.60
Para Rosanilin Hydrochloride	....	.75	1.50	5.25	9.60
Para Rosanilin Sulfate	....	.75	1.50	5.25	9.60
Patent Blue	....	.75	1.50	5.25	9.60
Pheno-safranine—See Safranine Y.					
Phloxine Red	....	1.00	2.00	7.25	....
Phosphine	....	.50	1.00	3.25	6.00
Picramic Acid—See Chemical List.					
Picro-Carmine	....	1.00	2.00	7.25	13.50
Poirrier's Blue	....	.75	1.50	5.25	9.60
Ponceau B	....	.50	1.00	3.25	6.00
Ponseau G	....	.50	1.00	3.25	6.00
Ponceau R	....	.50	1.00	3.25	6.00
Ponceau 3 R	....	.50	1.00	3.25	6.00
Primuline	....	.60	1.20	4.55	7.80
Pyronin 2G (Yellowish)	....	2.00	4.00	15.25	....
Prussian Blue	....	.50	1.00	3.25	6.00
Quinoline Yellow	....	1.00	2.00	7.25	13.50
Red Violet 5R	....	.75	1.50	5.25	9.60
Resazurin	....	5.00	10.00	....	....

	1 gm.	10 gm.	25 gm.	100 gm.	200 gm.
Rhodamine B	....	$1.00	$2.00	$7.25	$13.50
Rhodamine G	....	1.00	2.00	7.25	13.50
Rhodamine 6 G	....	1.00	2.00	7.25	13.50
Rhoduline GO	....	1.50	3.10	10.85	...
Rochelene	....	.50	1.00	3.25	6.00
Romanowsky Stain—See Giemsa's Blood Stain, Leishman's Stain, Wright's Stain and Hasting's Stain.					
Rosanilin Base	....	.75	1.50	5.25	9.60
Rosanilin Hydrochloride	....	.75	1.50	5.25	9.60
Rose Bengal	....	1.50	3.00	11.25	....
Roseine	....	.75	1.50	5.25	9.60
Rosolic Acid	....	.50	1.00	3.25	6.00
Rubin S—See Acid Fuchsin.					
Ruthenium Red	$5.00	....	....	....	....
Safranine A—Extra Conc.	....	.75	1.50	5.25	9.60
Safranine (Bluish) (Water Soluble)—See Methylene Violet.					
Safranine O (Reddish)—See Safranine Y.					
Safranine Y (For Bacilli)	....	.75	1.50	5.25	9.60
Scarlet B, Fat Soluble	....	.75	1.50	5.25	9.60
Scarlet G	....	.50	1.00	3.25	6.00
Scarlet MOO	....	.60	1.20	4.55	7.80
Scarlet R	....	.75	1.50	5.25	9.60
Scarlet Red Medicinal	....	.75	1.50	5.25	9.60
Scarlet 2R	....	.60	1.20	4.55	7.80
Setoglaucin O	....	.75	1.50	5.25	9.60
Solid Green—See Malachite Green, Crystals.					
Soluble Blue	....	.75	1.50	5.25	9.60
Spirit Black—See Nigrosine B.					
Spirit Blue—See Opal Blue.					
Spirit Yellow G—See Amino Azo Benzol.					
Stilbene Yellow	....	.50	1.00	3.25	6.00
Sudan I	....	.75	1.50	5.25	9.60
Sudan II	....	.75	1.50	5.25	9.60
Sudan III	....	.75	1.50	5.25	9.60
Sudan IV	....	.75	1.50	5.25	9.60
Sun Yellow	....	.50	1.00	3.25	6.00
Tartrazin	....	.50	1.00	3.25	6.00
Tetra Chrome Stain (McNeal)	.50	2.00	4.00	15.25	....
Thionin (Pure Lauth's Violet)	....	2.00	4.00	....	....
Thionin Blue, GO	....	1.00	2.00	....	....
Tieman's Soluble Blue	....	.50	1.00	3.25	6.00
Toluidin Blue (For Bacilli)	....	1.00	2.00	7.25	13.50
Toluylene Blue	.50	3.50	7.00	....	....
Toluylene Red—See Neutral Red.					
Tropaolin O	....	.75	1.50	5.25	9.60
Tropaolin OO	....	.75	1.50	5.25	9.60
Tropaolin OOO No. 1	....	.50	1.00	3.25	6.00
Tropaolin OOO No. 2	....	.50	1.00	3.25	6.00
Trypan Blue	....	.75	1.50	5.25	9.60
Trypan Red	....	2.00	4.00	15.25	....
Ultramarine Blue	....	....	....	.90	1.60
Uranin—See Fluorescein Na Salt.					
Vesuvin Brown—See Neutral Red.					
Victoria Blue	....	.75	1.50	5.25	9.60
Victoria Green	....	.75	1.50	5.25	9.60
Violet LBN	....	.75	1.50	5.25	9.60
Water Blue	....	.75	1.50	5.25	9.60
Wilson's Stain	.50	2.00	4.00	15.25	....
Wool Black	....	.50	1.00	3.25	6.00
Wright's Stain 0.25 (0.1 gm.)	.50	2.00	4.00	15.25	....
Yellow AB (Oil Sol.)	....	.50	1.00	3.25	6.00
Yellow KM	....	.50	1.00	3.25	6.00
Yellow OB (Oil Sol.)	....	.50	1.00	3.25	6.00
Yellow 66	....	.50	1.00	3.25	6.00

REAGENTS AND SOLUTIONS

Stains in Solution, Indicators in Solution, Blood Reagents, Diagnostic Reagents, Fixing Solutions and Mounting Media

For Standard Volumetric Solutions, See Page 435

	1 oz.	4 oz.	1 lb.
Acetic Acid (for white cell count)	....	$ .30	$ .60
Acetic Acid, 0.5%	....	.30	.60
Acetic Acid, 3%	....	.30	.60
Acetic Acid, 5%	....	.30	.60
Acetic Acid, 10%	....	.30	.60
Acetic Acid, 30%	....	.30	.60
Acetic Acid, 50%	....	.30	.60
Acetic Acid—Acetate Solution (For Folin's Amino Acid Nitrogen Determination)	....	.60	1.25
Acetone, 50%	....	.30	.60
Acetone Standard Stock Solution (1 ml. = 1 mg.) (Stability 1 month)	....	.60	1.00
Acetone Stock Solution (Behre & Benedict Method) (Stability Abt. 1 month) (1 ml. = 0.1 mg. Acetone)	....	.60	1.00
Acid Alcohol Decolorizing Fluid	....	.30	.75
Acid Dichromate Solution (For cleansing glassware)	....	....	.60
Acid Digestion Mixture (Folin-Wu Method)	....	.60	1.75
Acid Digestion Mixture	....	.60	1.75
Acid Fuchsin, 2% aq. solution	$ .30	.50	1.65
Acid Glycine Standard Stock Solution (1 ml. = 0.1 mg. Nitrogen)	....	.60	1.25
Acid Glycine Blood Standard Solution (1 ml. = 0.07 mg. Nitrogen)	....	.60	1.25
Acid Haemalum, Mayer's	.30	.50	1.65
Acid Hydrochloric, 10% (For Urea)	....	.40	.90
Acid Hydrochloric (For Creatinine in Urine)—See Normal HC1 Solution.			
Acid Methylene Blue, Gabbett	.30	.50	1.65
Acid Molybdate Purified Reagent	....	1.00	3.50
Acid Phosphomolybdic Reagent (Folin Wu)	....	.75	2.00
Acid Picramic, Standard Solution, 0.2%	....	.60	1.50
Acid Picric, Saturated Aq. Solution	....	.40	.75
Acid Silver Lactate Solution	....	.90	2.50
Acid Silver Lactate Solution, 3%	....	.90	2.50
Acid Zinc Solution	....	.60	1.25
Acidified Copper Sulfate Solution	....	.75	1.50
Acidified Ether	....	.75	1.25
Acidified Indicator Solution—See Ferric Ammonium Sulphate, Acidified Solution.			
Activating Phosphate Solution—See Buffer Mixture for Urea Determination.			
Albert's Stain for Diptheria	.30	.50	1.65
Alcohol, Acidulated with Sulfuric Acid	....	.30	.75
Alizarine, ½% Alcoholic Solution	.30	.50	1.65
Alizarine Solution, 1%	.30	.50	1.65
Alizarine 20% Paste	.40	.85	2.50
Alizarine Red S Solution (Alizarine Mono Sulphonate) (Sodium Sulphalizarate)	.30	.50	1.65
Alizarine Yellow R Solution	.30	.50	1.65
Alkali Blue 6 B Solution	.30	.50	1.65
Alkaline Alcoholic Wash Solution	....	.75	2.50
Alkaline Copper Solution (Folin Wu)	....	.50	1.25
Alkaline Potassium Ferricyanide Solution	....	.50	1.25
Alkaline Potassium Iodide Solution	....	.75	2.50
Alkaline Potassium Permanganate Solution	....	....	3.00
Almen Reagent	....	.90	2.75
Alpha Naphthylamine Acetate Solution	....	.60	1.50
Alpha Naphthylamine Solution	....	.60	1.50
Alum Carmine, Grenacher's	.30	.50	1.65
Alum Cochineal	.30	.50	1.65
Alum Haematoxylin	.35	.80	2.50
Aluminum Hydroxide Cream (Marshall & Welker Method)	....	.50	1.25
Aluminum Hydroxide Paste	....	.50	1.25
Amino Acid Standard Solution (1 ml. = 0.07 mg. Nitrogen)	....	.60	1.60
Ammonia, 2.5%	....	.50	.90
Ammonia Solution, Alcoholic	....	.65	1.25
Ammonia Solution (Van Slyke & Cullen Method)	....	.50	.90
Ammonia Solution, 2% (Clark & Collip Method)	....	.50	.90
Ammoniacal Silver Solution	....	.50	1.25
Ammoniated Silver for Uric Acid	....	.50	1.25
Ammonium Acetate, 5%	....	....	.50
Ammonium Acetate, 50%	....	....	1.00
Ammonium Chloride, 5%	....	....	.50
Ammonium Chloride Stock Solution (3.818 g. Ammonium Chloride in 1000 ml.)	....	.60	1.00
Ammonium Chloride Standard Solution (1 ml. = 0.01 mg. Nitrogen)	....	.60	1.00
Ammonium Chloride, Sat. Solution	....	.50	.90
Ammonium Chloride, 25%	....	.50	.90
Ammonium Molybdate Reagent	....	.75	1.50
Ammonium Nitrate, 60%	....	.60	1.00
Ammonium Oxalate, Sat. Solution	....	.60	1.00
Ammonium Oxalate, 0.5%	....	.60	1.00

	1 oz.	4 oz.	1 lb.
Ammonium Oxalate, 4%	....	$ .60	$1.00
Ammonium Oxalate, 3%	....	.60	1.00
Ammonium Oxalate Solution (Stability 1 mo.) (1 ml. = 0.1 mg. Oxygen)	....	.60	1.00
Ammonium Phosphate, 5%	....	....	.50
Ammonium Sulfate Sat. Solution	....	.60	1.00
Ammonium Sulfate Standard Solution (1 ml. = 1 mg. $(NH_4)_2SO_4$)	....	.60	1.00
Ammonium Sulfate Standard Solution (Folin Wu Method) (3 ml. = 0.3 mg. Nitrogen)	....	.60	1.00
Ammonium Sulfate Standard Solution (5 ml. = 0.15 mg. Nitrogen)	....	.60	1.00
Ammonium Sulfate Standard Solution (0.05 N. Sulfuric Acid) (5 ml. = 1 mg. Nitrogen)	....	.60	1.00
Ammonium Sulfide (Hemochromogen Test)—See Chemical List.			
Ammonium Thiocyanate Standard Solution (1 ml. = 1 ml. Silver Reagent = 10 mg. NaCl)	....	.60	1.00
Ammonium Thiocyanate Standard Solution (2 ml. = 1 mg. NaCl)	....	.60	1.00
Ammonium Thiocyanate Standard Solution (2 ml. = 1 ml. Silver Reagent = 10 mg. NaCl)	....	.60	1.00
Aniline Gentian Violet, Gram's	$ .30	.50	1.65
Antiformin Solution A	....	.40	.75
Antiformin Solution B	....	.40	.75
Arsenotungstic Color Reagent—See Uric Acid Reagent, Benedict's New.			
Arsenophosphotungstic Acid Reagent—See Uric Acid Reagent, Benedict's New.			
Asphaltum, Quick Drying	....	....	.75
Azolitmin Solution (Purest Litmus Solution)	....	.50	1.00
Balsam Canada—See Chemical List.			
Barfoed's Solution	....	.50	1.00
Barium Chloride, 5%	....	.35	.75
Barium Chloride, 10%	....	.40	.80
Barium Hydroxide, Sat. Solution	....	.50	.90
Basic Lead Acetate, Solution, U.S.P.	....	.30	.60
Benedict's Color Reagent	....	.60	2.00
Benedict's Solution, Qualitative 5-lb. bottle, **$5.00**	....	.40	1.25
Benedict's Solution, Quantitative (5 ml. = 10 mg. Glucose)	....	.50	1.75
Benedict's Sulfur Reagent	....	.50	1.75
Benzidine Base, Standard Solution (1 ml. = 0.015 mg. SO_4)	....	.50	1.50
Benzidine Base, Standard Solution (1 ml. = 0.03 mg. SO_4)	....	.50	1.50
Benzidine Base, Standard Solution (1 ml. = 0.15 mg. SO_4)	....	.50	1.50
Benzidine Base, Stock Solution (1 ml. = 1.5 mg. SO_4)	....	.50	1.50
Benzidine Solution (For Occult Blood)	....	.40	.90
Benzidine Solution (For Inorganic Sulphate)	....	.50	1.50
Benzoic Acid Solution, Saturated (Folin Wu Method)	....	.40	.90
Bial Reagent	....	.50	1.50
Biondi-Ehrlich-Heidenhain Triple Stain	.50	1.50	....
Bismark Brown, 1% aq.	.30	.50	1.65
Black Reagent	....	.50	1.75
Bogen's Universal Indicator Solution A useful indicator for determining the approximate hydrogen ion concentration of solution. Recommended for urine analysis. The color changes are as follows: Red—indicates about pH. 2.0 (very strong acid). Orange—indicates about pH. 4.0 (strong acid). Yellow—indicates about pH. 6.0 (weakly acid). Yellowish Green—indicates about pH. 7.0 (neutral). Green—indicates about pH. 8.0 (weakly alkaline). Blue—indicates about pH. 10.0 (strongly alkaline).	.40	1.00	3.00
Borax Carmine, Grenacher's	.30	.50	1.65
Borax Saturated Solution	....	.35	.75
Boutron & Boudet Soap Solution (Zero Hardness)	....	....	1.50
Brilliant Cresyl Blue Solution	.35	.85	2.75
Brom Cresol Purple, 0.04% Alc. Solution	.40	1.00	3.00
Brom Cresol Purple, 0.04% Aq. Solution	.40	1.00	3.00
Brom Phenol Blue, 0.04% Alc. Solution	.40	1.00	3.00
Brom. Phenol Blue, 0.04% Aq. Solution	.40	1.00	3.00
Brom Thymol Blue, 0.04% Alc. Solution	.40	1.00	3.00
Brom Thymol Blue, 0.04% Aq. Solution	.40	1.00	3.00
Brucke's Solution	....	.50	1.75
Buffer Mixture (For Urea Determination)	....	.45	1.25
Buffer Solution (For Urea Determination)	....	.45	1.25
Buffer Solution (Giordano Method) (For Wright's Stain)	....	.45	1.25
Calcium Chloride, 1%	....	.50	.90
Calcium Chloride, 0.5% (Howell Method)	....	.50	.90
Calcium Chloride, 2.5%	....	.50	.90
Calcium Chloride, Saturated	....	.50	.90
Calcium Chloride, Standard Sol. (1000 ml. = 0.25 g. Calcium Chloride)	....	.60	1,00
Calcium Chloride, Standard Solution (1 ml. = 1 mg. Calcium Carbonate)	....	.60	1.00
Calcium Hydroxide, 5% Suspension	....	.60	.90
Calcium Hydroxide, 10% Suspension	....	.60	.90
Canada Balsam—See Chemical List.			
Carbol Fuchsin, Gabbett's	.30	.50	1.65
Carbol Fuchsin, Ziehl-Neelson's	.30	.50	1.65
Carbol Gentian Violet	.30	.50	1.65
Carmalum, Mayer	.30	.50	1.65
Cedarwood Oil—See Chemical List.			

	1 oz.	4 oz.	1 lb.
Cholesterol Standard Stock Solution (100 ml. = 0.08 g. Cholesterol)	....	$ .75	$1.50
Cholesterol Standard Stock Solution (0.160 g. in 100 ml. Chloroform)	....	.75	1.50
Cholesterol Standard Working Solution (10 ml. = 0.8 mg. Cholesterol)	....	.75	1.50
Cleaning Solution for Glass—See Acid Dichromate Solution.			
Cobaltous Chloride Solution	....	.60	1.00
Cobaltous Chloride Solution (12 g. in 1000 ml.)	....	.60	1.00
Cobalt Chloride (150 g. in 500 ml.)	....	.75	1.50
Cobalt Sulfate Standard Solution McNee (3.92 g. Cobalt Sulfate, Cryst. in 100 ml.)	....	.60	1.00
Cochineal Solution	$ .30	.50	1.65
Colloidal Gold Solution For Lange's Test 60 ml. ampules, **$ .60;** 250 ml. bottles, **$3.00;** 500 ml. bottles, **$5.00.**			
Colloidal Iron, 5% Solution	....	.40	1.00
Combined Reagents (For Acetone Bodies)	....	.40	1.00
Congo Red Indicator Solution	.30	.50	1.65
Copper Reagent, Benedict's	....	.50	1.25
Copper Reagent, Folin-Wu, Aklaline (For blood sugar determination)—See Alkaline Copper Solution.			
Copper Standard Solution (1 ml. = 0.2 mg. Copper)	....	.60	1.25
Copper Sulfate, 0.5%	....	.35	.75
Copper Sulfate, 5%	....	.35	.75
Copper Sulfate, 10%	....	.35	.75
Copper Sulfate, 20%	....	.35	.75
Copper Sulfate Solution	....	.35	.75
Creatinine Standard Stock Solution (1 ml. = 1 mg. Creatinine)	....	.75	1.50
Creatinine Standard Solution (Folin Wu Method) (100 ml. = 0.1 mg. Creatinine)	....	.75	1.50
Creatinine Standard Solution (Folin Wu Method) (5 ml. = 0.03 mg. Creatinine)	....	.75	1.50
Creatinine Standard Solution (5 ml. = 0.05 mg. Creatinine)	....	.75	1.50
Creatinine Standard Solution (5 ml. = 0.075 mg. Creatinine)	....	.75	1.50
Creatinine Standard Solution (100 ml. = 0.3 mg. Creatinine)	....	.75	1.50
Creatinine Standard Solution (100 ml. = 0.5 mg. Creatinine)	....	.75	1.50
Creatinine Standard Solution (100 ml. = 1 mg. Creatinine)	....	.75	1.50
Cresol Red, 0.04% Alc. Solution	.40	1.00	3.00
Cresol Red, 0.04% Aq. Solution	.40	1.00	3.00
Cyanide—Carbonate Solution	....	.60	1.25
Dahlia, Sat. Aq. Solution	.30	.50	1.65
Damar in Xylol Prepared for use in mounting sections	.45	1.40	4.40
Denis Sulfur Reagent	....	.75	1.75
Dialyzed Iron, 5%—See Colloidal Iron, 5%.			
Diazo Reagent, Ehrlich's Solution A	.30	.50	1.50
Diazo Reagent, Ehrlich's Solution B	.30	.50	1.50
Digestion Mixture, Folin (For Total Nitrogen)—See Acid Digestion Mixture.			
Diluting Fluid, Wright-Kinnicutt	....	.50	1.50
Diluting Fluid	....	.50	1.50
Diluting Fluid, Leake & Guy	....	.50	1.50
Diluting Fluid, Rees & Eckers	....	.50	1.50
Diluting Fluid, Stock Solution for Strumia's Blood Stain	....	.30	.50
Dilute Hydrochloric Acid, Approx. 3 N—See Hydrochloric Acid.			
Dimethlamidoazobenzene Solution (Topfer's Indicator)—See Topfer's Indicator.			
Dinitrosalicylic Acid Reagent H&B-848	....	1.75	5.00
Dinitrosalicylic Acid Reagent K&B-572	....	1.75	5.00
Ehrlich's Aldehyde Reagent	.35	.75	2.00
Eosin, Aq. Solution	.30	.50	1.65
Eosin, Yellowish, 70% Alc. Solution	.30	.50	1.65
Erythrosine Indicator	.30	.50	1.65
Esbach's Reagent	....	.30	.50
Ethyl Orange Solution	.35	.75	2.00
Ethyl Red Solution	.35	.75	2.00
Exton Reagent	....	.60	1.25
Farrant's Medium	.40	1.15	4.00
Ferric Chloride, 10% Solution	....	.35	.50
Fehling's Solution, Alkaline 5-lb. bottle, **$2.50**	....	.35	.60
Fehling's Solution, Copper 5-lb. bottle, **$2.00**	....	.30	.50
Fehling Soxhlet Solution No. 1	....	.35	.60
Fehling Soxhlet Solution No. 2 (Cuprous Titration)	....	.30	.50
Ferric Alum, 5%	....	.40	.75
Ferric Alum, Saturated	...	.45	1.00
Ferric Alum Stock Solution (0.1508 g. in 100 ml.)	....	.60	1.00
Ferric Ammonium Sulfate Solution (0.8625 g. in 100 ml.)	....	.60	1.00
Ferric Ammonium Sulphate, Acidified Solution (For determination of Chlorides in Urine)	....	.60	1.00
Ferric Chloride, 10.5% in 0.2 N HCl	....	.60	1.00
Ferric Chloride, in Hydrochloric Acid—See Obermayer's Reagent.			
Ferric Chloride, 3% (Gerhardt)	....	.35	.50
Ferric Chloride, 10%	....	.35	.50
Ferric Chloride, 0.5%	....	.35	.50
Ferric Chloride Solution	....	.35	.50
Ferric Chloride, 0.08 M	....	.60	1.00
Ferric Chloride (200 g. in 500 ml.)	....	.60	1.00

	1 oz.	4 oz.	1 lb.
Ferric Iron Gum Ghatti Solution	....	$ .75	$2.00
Folin—Dennis Reagent for Uric Acid—See Uric Acid Reagent.			
Folin—McElroy Reagent	....	.75	2.00
Formalin, 10% Solution	....	....	.40
Fuchsin Acid—See Acid Fuchsin.			
Fuchsin Basic, Sat. Alc. Solution	$ .35	.75	2.00
Fuchsin Basic, Saturated Aqueous Solution	.30	.50	1.65
Fuchsin Solution, Basic (0.1 g. in 1000 ml.)	.30	.50	1.65
Gabbett's Acid Methylene Blue	.30	.50	1.65
Gabbett's Stain No. 1	.30	.50	1.65
Gabbett's Stain No. 2	.30	.50	1.65
Gallein Solution	.35	.75	2.00
Gentian Violet—Carbol	.30	.50	1.65
Gentian Violet—Gram's	.30	.50	1.65
Gentian Violet—Stirling's	.30	.50	1.65
Gentian Violet, Saturated Alcoholic Solution	.35	.75	2.00
Gentian Violet, Aq. Solution	.30	.50	1.65
Giemsa's Azur II Solution	.35	.75	2.00
Giemsa's Blood Stain—Stock Solution	.50	1.25	4.00
Glucose (For Glucose Tolerance Test)—See Dextrose in Chemical List.			
Glucose, Standard Stock Solution (For Folin-Wu Blood Sugar Determination) (1 gram per 100 ml.) 1%	....	.60	1.50
Glucose Standard Solution (Folin) (1 ml. = .1 mg. Glucose)	....	.60	1.50
Glucose Standard Solution (Folin) (1 ml. = 0.2 mg. Glucose)	....	.60	1.50
Glucose Standard Solution (3 ml. = 1 mg. Glucose)	....	.60	1.50
Glucose Standard Solution (1 ml. = 0.01 mg. Glucose) (Stability about 1 month)	....	.60	1.50
Glucose Standard Solution 0.1%	....	.60	1.50
Glycerin Jelly	.40	1.60	3.00
Glycine Standard Solution (1 ml. = 0.07 mg. Nitrogen)	....	.60	1.50
Glycine Standard Stock Solution (1 ml. = 0.1 mg. Nitrogen)	....	.60	1.50
Goldhorn's Methylene Blue (Polychrome)—See Methylene Blue.			
Gram's Iodine Solution	.25	.45	1.10
Guaiac Solution (Guaiac Test)	.30	.60	1.25
Gum Acacia Solution 1%	....	.40	.90
Gum Ghatti Solution 1%	....	.40	.90
Gum Ghatti Solution	....	.40	.90
Gunzberg's Reagent	.60	....	....
Haematoxylin Solution	.35	.80	2.50
Haematoxylin, Boehmer's	.35	.80	2.50
Haematoxylin, Delafield's	.35	.80	2.50
Haematoxylin, Ehrlich's	.35	.80	2.50
Haematoxylin, Grenacher's	.35	.80	2.50
Haematoxylin Iron, Heidenhain's No. 1	.25	.40	1.00
Haematoxylin Iron, Heidenhain's No. 2	.35	.80	2.50
Haemalum, Mayer's	.35	.80	2.50
Haine's Solution Qualitative	....	.40	1.00
Haine's Solution Quantitative	....	.50	1.50
Hasting's Blood Stain	.40	1.25	4.00
Hayem's Solution	.30	.50	1.25
Hopkins—Cole Reagent (Albumin Test)	.35	.75	2.00
Hydrochloric Acid, 25%	....	....	.90
Hydrochloric Acid, 10%	....	....	.90
Hydrochloric Acid, 2%	....	....	.90
Hydrochloric Acid, 1:1	....	....	.90
Hydrochloric Acid, 1:4	....	....	.90
Hydrochloric Acid, 1:5	....	....	.90
Hydrochloric Acid, 3 N	....	....	.90
Hydrochloric Acid, 10 N	....	....	.90
Hydrogen Sulfide Solution, Saturated	....	....	.90
Hydroquninone—Bisulfite Reagent, Benedict's. (For Phosphorous in Blood)	....	.40	1.00
Indigo Carmine Solution (For Renal Function Test) 12 ampules in box, **$2.00 box.**			
Indigo—Sulfuric Acid Solution (1 ml. = 1 mg.)	....	.90	3.00
Invert Sugar Standard Solution (100 ml. = 0.2 g. Invert Sugar)	....	1.25	4.00
Iodate—Iodide Solution	....	.60	1.75
Iodide-Sulfate-Chloride Solution	.30	.50	1.25
Iodine Solution, Gram's—See Gram's Iodine Solution.			
Iron Dialyzed—See Colloidal Iron.			
Iron Standard Solution (1 ml. = 0.1 mg. Iron) APHA-48	....	.60	1.25
Iron Standard Solution (1 ml. = 0.1 mg. Iron) H & B-467	....	.60	1.25
Iron Standard Solution (1 ml. = 0.5 mg. Iron)	....	.60	1.25
Jenner's Blood Stain	.50	1.25	4.00
Lacmoid Solution	.30	.50	1.65
Lactic Acid, 10% (Van Slyke & Cullen Method)	....	....	.60
Lead, Powdered Metallic (For Creatine in Urine)—See Chemicals.			
Lead Standard Solution (1 ml. = 1 mg. Lead)	....	.60	1.25

	1 oz.	4 oz.	1 lb.
Lead Acetate Solution (10 g. in 100 ml.)	....	$ .40	$ .90
Leishman's Blood Stain	$ .50	1.25	4.00
Lithium Oxalate Solution	.25	2.00	....
Anti-coagulant—See Chemical List.			
Lithium Carmine, Orth's	.30	.50	1.65
Lithium Chloride Acid Solution	....	.45	1.00
Litmus—See Azolitmin Solution.			
Lyle-Curtman Guaiac Reagent (Guaiac Test)	.60	1.50	5.00
Loeffler's Methylene Blue	.30	.50	1.65
Lugol's Solution	.25	.45	1.10
MacNeal's Tetra Chrome Blood Stain	.50	1.25	4.00
Magnesia Mixture H&B-879	.35	.80	....
Magnesia Mixture H&B-734 and H&B-841	....	.35	.80
Magnesia Mixture for Phosphates	....	.35	.80
Magnesium Chloride Alc. Solution, Saturated	.50	.90	3.00
Magnesium Nitrate, 10%	....	.40	.90
Magnesium Sulfate, Saturated Solution	....	.40	.90
Malachite Green, 1% Aq. Solution	.30	.50	1.65
Mallory's Aniline Blue	.30	.50	1.65
Manganese Dioxide Suspension	....	.40	1.00
Manganese Standard Solution (1 ml. = 0.1 mg. Manganese)	....	.60	1.25
Manganous Sulfate Solution	....	.75	1.50
Mayer's Albumen Fixative	.45	1.20	4.50
May-Greenwald Stain	.50	1.25	4.00
Mercuric Chloride 0.05 M	....	.60	1.25
Mercuric Chloride, 5%	....	.60	1.25
Mercuric Chloride in Alcohol, 0.1%	....	.60	1.25
Mercuric Sulfate, 10%	....	.60	1.25
Mercurochrome, 2% Solution	.30	.60	2.00
Methylene Blue, 1% Aq. Solution	.30	.50	1.65
Methylene Blue, Saturated Alc. Solution	.35	.75	2.00
Methylene Blue, Gabbett's	.30	.50	1.65
Methylene Blue, Loeffler's	.30	.50	1.65
Methylene Blue, Neisser's	.30	.50	1.65
Methylene Blue, Polychrome Unna's	.30	.50	1.65
Methylene Blue, Polychrome, Goldhorn's	.30	.50	1.65
Methylene Blue Reagent Solution	.30	.50	1.65
Methyl Green, 1% Aq. Solution	.35	.75	2.00
Methyl Orange Indicator Solution	.30	.50	1.65
Methyl Red Solution	.30	.50	1.65
Methyl Red, Alcoholic Solution, Saturated	.30	.50	1.65
Methyl Violet, 1% Aq. Solution	.30	.50	1.65
Methyl Violet, Saturated Alc. Solution	.35	.75	2.00
Meyer's Reagent (For Blood Test)	.35	.75	2.00
Mercury Metallic—See Chemical List.			
Millon's Reagent	.50	1.20	4.00
Mineral Oil—See Oil Paraffine, Chemical List.			
Molisch's Reagent (Carbohydrates)	.35	.80	2.50
Molybdate Phosphate Solution (Folin Wu Method)—See Acid Phosphomolybdic Reagent (Folin Wu).			
Molybdate Solution No. 1 (Fiske & Subbarrow Method)	....	.60	1.25
Molybdate Solution No. 2 (Fiske & Subbarrow Method)	....	.60	1.25
Molybdate Solution No. 3 (Fiske & Subbarrow Method)	....	.60	1.25
Molybdate Solution H&B-878	....	.60	1.25
Molybdic Acid Reagent, Benedict's (For Phosphorous in Blood)	....	.75	1.50
Molybdic Sulfuric Acid, Mixture A	....	.75	1.50
Molybdate Sulfuric Acid, Mixture B	....	.75	1.50
Naphthol Green B Standard, 0.005% Solution	....	.80	2.25
Naphthol Green B—See Indicators.			
Naphthoresorcinol Solution 1%	.90	3.00	....
Neisser's Stain, Solution I	.30	.50	1.65
Neisser's Stain, Solution II	.30	.50	1.65
Nessler Solution (Folin Modified also known as Folin Wu Modified, Dilute or Working Solution) 5-lb. bottle, **$6.25.**	....	.50	1.75
Nessler Solution (Bock & Benedict) 5-lb. bottle, **$6.25**	....	.50	1.75
Nessler Reagent	....	.50	1.75
Neutral Red Solution	.30	.50	1.65
Nitric Acid, 1:10	....	....	.90
Nitrogen Standard Solution (5 ml. = 1 mg. Nitrogen)	....	.60	1.00
Nitrogen Standard Solution (5 ml. = 0.3 mg. Nitrogen)	....	.60	1.00
Nitrogen Standard Solution (5 ml. = 0.1 mg. Nitrogen)	....	.60	1.00
Nylander's Reagent	....	.60	1.25
Obermayer's Reagent	....	.45	.90
Oliver Reagent	....	.75	1.50
Orange G, Aq. Solution	.30	.50	1.65
Orcein, Alcoholic Solution	.35	.75	2.00
Orcin Reagent (For Pentoses)	.50	.80	2.50
Ortho Cresol Phthalein Solution	.35	.75	2.00

	1 oz.	4 oz.	1 lb.
Orthotolidine Solution (Rutban & Hardisty Method)	....	$ .60	$1.25
Ortho Tolidin Solution (For Water Analysis) 5-lb. bottle, **$5.00**	....	.60	1.25
Orthotoluidine Test Reagent (Stability 1 mo.)	....	.60	1.25
Oxalic Acid, 2.5%	....	.40	.75
Oxalic Acid, Saturated Solution	....	.45	.90
Pandy's Solution	....	.50	1.65
Paraffin Wax—See Chemical List.			
Paranitraniline Solution	....	.60	1.25
Para Nitro Phenol Solution	$ .30	.50	1.65
Perchloric Acid, 60%—See Chemical List.			
Phenacetolin Solution	.30	.50	1.65
Phenoldisulfonic Acid Solution	....	1.00	2.50
Phenolphthalein, 0.25%	.30	.60	1.25
Phenolphthalein, 1%	.30	.60	1.25
Phenolphthalein, 5%	.30	.60	1.25
Phenolphthalein Indicator	.30	.60	1.25
Phenolphthalein, Meyer's—See Meyer's Reagent.			
Phenol Reagent (Folin & Ciocalteu) Phosphotungstic Phosphomolybdic Reagent	....	.75	2.75
Phenol Reagent	....	.75	2.75
Phenol Red Solution, 0.04% Alc. Solution	.40	1.00	3.00
Phenol Red Solution, 0.04% Aq. Solution	.40	1.00	3.00
Phenol Red, 0.05% Aq. Solution	.40	1.00	3.00
Phenol Standard Solution (10 ml. = 1 mg. Phenol)	....	.60	1.25
Phenol Standard Solution (10 ml. = 0.025 mg. Phenol)	....	.60	1.25
Phenol Sulfon Phthalein Standard—See Phenol Sulfon Phthalein Ampoules.			
Phenol Sulfon Phthalein Solution (For Renal Function Test) 12 ampoules in box, **$1.50 box.**			
Phosphate Buffer—See Buffer Mixture.			
Phosphate Buffer, M/2	....	.45	1.25
Phosphate Standard Stock Solution (1 ml. = 1 mg. Phosphorous)	....	.60	1.00
Phosphate Standard Stock Solution (10 ml. = 1 mg. Phosphorus)	....	.60	1.00
Phosphate Standard Solution (2 ml. = 0.02 mg. Phosphorus)	....	.60	1.00
Phosphate Standard Solution (Fiske & Subbarrow Method) (5 ml. = 0.4 mg. Phosphorus)	....	.60	1.00
Phosphate Standard Solution (3 ml. = 0.025 mg. Phosphorus)	....	.60	1.00
Phosphate Standard Stock Solution (1 ml. = 1 mg. Calcium)	....	.60	1.00
Phosphate Standard Solution (10 ml. = 0.1 mg. Calcium)	....	.60	1.00
Phosphate Standard Stock Solution (1 ml. = 1 mg. Magnesium)	....	.60	1.00
Phosphate Standard Solution (1 ml. = 0.01 mg. Magnesium)	....	.60	1.00
Phosphomolybdic Acid Reagent (Special)—See Acid Phosphomolybdic Reagent.			
Phosphomolybdic Acid Reagent—See Acid Phosphomolybdic Reagent.			
Phosphoric Sulfuric Acid Copper Sulfate Mixture—See Acid Digestion Mixture.			
Phosphotungstic Acid (Folin)—See Uric Acid Reagent—Folin.			
Picramic Acid, 0.2%—See Acid Picramic.			
Picric Acid Solution (2 g. in 1000 ml.)	....	.40	.75
Picric Acid Solution Half Sat.	....	.40	.75
Picric Acid Solution—See Acid Picric, Saturated Aq. Solution.			
Picric Citric Acid Reagent—See Esbach's Reagent.			
Picro-Aniline Blue	.35	.75	2.00
Picro Carmine	.35	.75	2.00
Picro Carmine, Ranvier's	.35	.75	2.00
Picro Fuchsin, VanGieson's	.35	.75	2.00
Picro Carmine, Weigart's	.35	.75	2.00
Plaster of Paris—See Chemical List.			
Plaster of Paris (Dental Plaster)—See Chemical List.			
Platinic Chloride Solution, 10%—See Chemical List.			
Platinum Cobalt Standard Color 500	....	1.25	5.00
Poirrier's Blue Solution	.30	.50	1.65
Ponder's Stain	.30	.50	1.65
Potassium Carbonate,—Oxalate Solution	....	.60	1.25
Potassium Carbonate, 4 N	....	....	1.00
Potassium Carbonate, Solution, Saturated	....	....	.90
Potassium Chlorate, 5%	....	.40	.75
Potassium Chloride, Potassium Iodide, Potassium Bromide Solution (Nippe Method)	....	.75	2.00
Potassium Chloroplatinate Solution (2 g. in 1000 ml.)	....	3.00	....
Potassium Chloroplatinate Solution (4 g. in 1000 ml.)	....	5.75	....
Potassium Chromate Indicator Solution	....	.50	.90
Potassium Cyanide, 0.1%	....	.60	1.00
Potassium Cyanide, 5% (For Uric Acid)	....	.60	1.00
Potassium Dichromate 0.01%	....	.50	.90
Potassium Dichromate, 5%	....	.50	.90
Potassium Dichromate, 1%	....	.50	.90
Potassium Dichromate Sulfuric Acid Mixture (Clark & Collip Method)—See Acid Dichromate. Solution for Cleaning Glassware.			
Potassium Dichromate, 0.2%	....	.50	.90
Potassium Dichromate Solution	....	.50	.90
Potassium Dichromate, 0.025 N	....	....	1.00
Potassium Dichromate Standard Solution (1 ml. = 1 mg. Silica)	....	.60	1.25
Potassium Ferricyanide, 0.4%	....	.50	.90
Potassium Ferricyanide, 3%	....	.50	.90
Potassium Ferricyanide, 10%	....	.50	.90

	1 oz.	4 oz.	1 lb.
Potassium Ferricyanide, 20% (For Oxygen in Blood)	....	$ .50	$ .90
Potassium Ferricyanide Reagent	....	.50	.90
Potassium Ferricyanide Solution (Folin)	....	.50	.90
Potassium Ferrocyanide, 10%	....	.50	.90
Potassium Hydroxide, 1.8 N	....	....	1.00
Potassium Hydroxide Solution, 12 N	....	....	1.00
Potassium Hydroxide Solution, 10%	....	.60	.90
Potassium Hydroxide, Concentrated	....	....	1.00
Potassium Iodate, 0.005 N	....	.75	1.25
Potassium Iodate Solution	....	.75	1.25
Potassium Iodide Standard Stock Solution (1 ml. = 10 mg. Iodine)	....	.75	1.25
Potassium Iodide Standard Stock Solution (1 ml. = 0.1 mg. Iodine)	....	.75	1.25
Potassium Iodide Standard Working Solution (1 ml. = .001 mg. Iodine)	....	.75	1.25
Potassium Iodide, 1%	....	.50	.90
Potassium Iodide, 2%	....	.50	.90
Potassium Iodide, 5%	....	.60	1.00
Potassium Iodide, 10%	....	.75	1.25
Potassium Iodide, 20%	....	.80	1.50
Potassium Iodide, 0.2 M	....	.60	1.00
Potassium Nitrate, 1%	....	.40	.75
Potassium Nitrite, 1%	....	.40	.75
Potassium Oxalate, Saturated Solution	....	.60	1.25
Potassium Oxalate, 2% (For Oxalating Blood)	....	.45	.90
Potassium Oxalate, Sat. Solution (For Oxalating Blood)	....	.60	1.25
Potassium Oxalate, 20%	....	.60	1.25
Potassium Oxalate Solution	....	.45	.90
Potassium Permanganate, 1%	....	.45	.90
Potassium Permanganate Solution (1 ml. = 0.1 mg. Oxygen)	....	.60	1.25
Potassium Permanganate Solution	....	.45	.90
Potassium Permanganate, Saturated	....	.45	.90
Potassium Persulfate Solution (According to Wong—For Micro Nitrogen Determination)	....	.60	1.00
Potassium Pyroantimoniate Reagent (Stability 1 month)	....	1.25	4.00
Potassium Reagent (Stability 1 month)	....	1.25	4.00
Potassium Sulfate, Saturated	....	.45	.90
Potassium Sulfate Standard Stock Solution (1 ml. = 2 mg. Potassium)	....	.60	1.00
Potassium Sulfate Standard Solution (5 ml. = 0.1 mg. Potassium)	....	.60	1.00
Potassium Sulfate (For Nitrogen Determination)—See Chemical List.			
Potassium Sulfide Solution	....	.60	1.00
Potassium Thiocyanate Solution	....	.60	1.00
Potassium Thiocyanate, 10%	....	.45	.90
Potassium Thiocyanate, 20%	....	.45	.90
Potassium Sulfocyanate Solution M/35.46 (For Blood Chlorides-Whitehorn)	....	.60	1.00
Potassium Thiocyanate, 3 N	....	.60	1.00
Propyl Red Solution	$ .35	.75	2.00
Purdy's Solution	....	.60	1.25
Pyronin, 1% Aq. Solution	.30	.50	1.65
Pyronin—Methyl Green Solution (Pappenheim)	.35	.75	2.00
Resazurin Solution	.35	.75	2.00
Robert's Reagent	....	.60	1.00
Rosolic Acid Solution	.35	.75	2.00
Rothera Reagent	.35	.75	2.00
Safranine, 1% Aq. Solution	.30	.50	1.65
Safranine, Sat. Alc. Solution	.35	.75	2.00
Salicylic Acid, 1% Alcoholic	....	.50	1.65
Salicylic Aldehyde, 10% Alc.	....	1.00	3.50
Salicylic Aldehyde (Behre & Benedict Method)	.45	1.25	4.00
Saponine, 1% (Van Slyke Method)	....	.40	.75
Schiff's Reagent	....	.60	1.25
Scott-Wilson Reagent	.50	.90	3.00
Seeliwanoff Reagent	....	.60	1.50
Silver Lactate Solution in Lactic Acid	.50	1.25	4.00
Silver Nitrate Standard Solution (1 ml. = 0.5 mg. Chloride Radicle)	....	.75	1.25
Silver Nitrate Solution (20 g. in 1000 ml.)	....	.75	1.25
Silver Nitrate Standard Solution (1 ml. = 0.010 g. Sodium Chloride)	....	.75	1.25
Silver Nitrate Standard Solution (1 ml. = 10 mg. Sodium Chloride)	....	.75	1.25
Silver Nitrate Standard Solution (Whitehorn) (1 ml. = 1 mg. Chlorine M/35.46)	....	.75	1.25
Silver Nitrate Solution (1 ml. = 1 mg. Sodium Chloride)	....	.75	1.25
Silver Nitrate, 5%	....	.75	1.25
Silver Nitrate, 3%	....	.75	1.25
Silver Nitrate Acidified Ferric Alum Solution (2 ml. = 1 mg. NaCl)	....	.75	1.25
Silver Nitrate Solution	....	.75	1.25
Silver Reagent	....	1.25	3.00
Silver Sulfate Standard Solution (1 ml. = 1 mg. Chloride Radicle)	....	.75	1.25
Sive's Red Solution	.35	.75	2.00
Soda Reagent (Non-Carbonate Hardness)	....	.60	1.00
Sodium Acetate, 3 M	....	.60	1.00
Sodium Acetate Special Solution	....	.75	1.25
Sodium Acetate, 20%	...	.60	1.00

	1 oz.	4 oz.	1 lb.
Sodium Acetate, 50%	....	$ .75	$1.25
Sodium Ammonium Phosphate, Saturated	....	.60	1.00
Sodium Bicarbonate Solution Saturated	....	.40	.75
Sodium Bisulfite, 1% (Stability 1 month)	....	.75	1.25
Sodium Bisulfite, 15% (Fiske & Subbarrow Method)	....	.75	1.25
Sodium Bisulfite Solution	....	.75	1.25
Sodium Carbonate Solution (Special) (8.5 ml. = 20 ml. N/10 Acid)	....	.60	1.00
Sodium Carbonate, 10%	....	.40	.75
Sodium Carbonate, 20%	....	.40	.75
Sodium Carbonate, 1% Titrated	....	.60	1.00
Sodium Carbonate, Saturated Solution	....	.40	.75
Sodium Chloride, Saturated Solution	....	.40	.75
Sodium Chloride Physiological 0.9%	....	.40	.65
Sodium Chloride, 0.5% (Sanford Method)	....	.40	.65
Sodium Chloride, 0.85% (Hayem Method)	....	.40	.65
Sodium Chloride, 1.8%	....	.40	.65
Sodium Chloride, 8% (Howell Method)	....	.40	.75
Sodium Chloride, 10% (For Reaction)	....	.40	.75
Sodium Chloride, 20%	....	.40	.75
Sodium Chloride, 10% in N/10 Hydrochloric Acid	....	.60	1.00
Sodium Chloride Standard Solution (1 ml. = 1 mg. chloride radicle)	....	.60	1.00
Sodium Citrate, Saturated	....	.60	1.00
Sodium Citrate, 3% (Cutter Vein Method)	....	.60	1.00
Sodium Citrate, 1% in Physiological Saline Solution	....	.60	1.00
Sodium Cyanide Carbonate Solution (Folin Method)	....	.75	1.25
Sodium Cyanide, 5%	....	.75	1.25
Sodium Cyanide, 15%	....	.75	1.25
Sodium Cyanide, 5% (Stability about 2 Mo.)	....	.75	1.25
Sodium Ethylate, approx. N.	....	1.00	3.00
Sodium Fluoride, 2½% Solution	....	.40	.90
Sodium Hydroxide, 1% (Wu & Ling Method)	....	.30	.50
Sodium Hydroxide, 5% Solution	....	.30	.50
Sodium Hydroxide, 10% Solution	....	.30	.50
Sodium Hydroxide, 10% plus 5% Rochelle Salts	....	.45	.75
Sodium Hydroxide, 20%	....	.30	.50
Sodium Hydroxide, 25%	....	.35	.55
Sodium Hydroxide, 32%	....	.35	.55
Sodium Hydroxide, 40%	....	.35	.55
Sodium Hydroxide (500 g. in 1000 ml.)	....	.35	.55
Sodium Hydroxide, Saturated Solution	....	.35	.55
Sodium Hydroxide (Carbonate Free) N/44 (1 ml. = 1 mg. Carbon Dioxide)	....	.60	1.00
Sodium Hydroxide (Carbonate Free) N/50 (1 ml. = 1 mg. Calcium Carbonate)	....	.60	1.00
Sodium Hydroxide, 0.02 N.	....	.60	1.00
Sodium Hydroxide, 2 N.	....	.60	1.00
Sodium Hydroxide, 2.6 N.	....	.60	1.00
Sodium Hydroxide, 5 N.	....	.60	1.00
Sodium Hypobromite Solution	....	1.00	3.00
Sodium Hypochlorite Solution—See Chemical List.			
Sodium Nitrate, 10%	....	.30	.50
Sodium Nitrite Standard Solution (1 ml. = 0.0005 mg. Nitrogen)	....	.60	1.00
Sodium Nitrite Stock Solution	....	.60	1.00
Sodium Oxalate, 1% (Howell Method)	....	.60	1.00
Sodium Oxalate, 1.6% (Finger Method)	....	.60	1.00
Sodium Sulfate, 20%	....	.45	.75
Sodium Sulfate, 22.2%	....	.45	.75
Sodium Sulfide Solution	....	.75	2.00
Sodium Sulfite, 20% (Fiske & Subbarrow Method)	....	.45	.75
Sodium Thiosulfate, 4% Solution (For Amino Acid Nitrogen Determination)	....	.45	.75
Sodium Thiosulfate, N/75	....	.60	1.00
Sodium Thiosulfate, 0.025 N.	....	.60	1.00
Sodium Thiosulfate, .005 N.	....	.60	1.00
Sodium Thiosulfate (1 ml. = 0.001 g. Fluorine)	....	.60	1.00
Sodium Tungstate, 10% Solution	....	.30	.85
Sodium Sulphalizarate—See Alizarine Red S.			
Soluble Starch—See Chemical List.			
Soluble Starch, 1%	....	.50	.90
Solution for Malaria in Blood (Bass & Johns Method)	....	.60	1.25
Solution No. 1 (Washburn Method) (Stability about 6 months)	....	.90	2.50
Solution A (Alkaline Ferricyanide)	....	.60	1.25
Solution B (KI, $ZnSO_4$, NaCl)	....	.60	1.25
Solution C (Dilute Acetic Acid)	....	.30	.50
Special Acetic Acid Acetate Solution—See Acetic Acid—Acetate Solution.			
Standard Nitrate Solution (1 ml. = 0.01 mg. Nitrate Nitrogen)	....	.60	1.00
Standard Soap Solution (1 ml. = 1 mg. Calcium Carbonate)	....	.75	1.50
Standard Uric Acid Solution, Benedict's (For Uric Acid in Blood and Urine)—See Uric Acid.			
Standard Uric Acid Solution, Folin (For Uric Acid in Blood and Urine)—See Uric Acid.			
Stannous Chloride Stock Solution (10 g. in 25 ml. Hydrochloric Acid)	....	.75	1.50
Starch Solution	....	.50	.90
Starch Solution (Arrowroot)	....	.50	.90

	1 oz.	4 oz.	1 lb.
Stoke Reagent (Hemochromogen Test)	$ .40	$1.00	$3.00
Strumia's Blood Stain	.50	1.50	5.00
Sudan III Solution	.35	.75	2.00
Sugar Standard Solution—See Glucose.			
Sulfocyanate Standard Solution—See Ammonium Thiocyanate.			
Sulfosalicylic Acid Solution (For estimation of Bile Acids)	....	.75	1.50
Sulfosalicylic Acid, 2%	....	.75	1.50
Sulfosalicylic Acid, 3%	....	.75	1.50
Sulfuric Acid, 1:1	....	....	.90
Sulfuric Acid, 1:3	....	....	.90
Sulfuric Acid, 1:5	....	....	.90
Sulfuric Acid, 5%	....	....	.90
Sulfuric Acid, 10% (Haden Method)	....	....	.90
Sulfuric Acid, 50%	....	....	.90
Sulfuric Acid, 0.62 N.	....	....	1.00
Sulfuric Acid, 2 N.	....	....	1.00
Sulfuric Acid, 2.6 N.	....	....	1.00
Sulfuric Acid, 3.5 N.	....	....	1.00
Sulfuric Acid, 4 N.	....	....	1.00
Sulfuric Acid, 5 N.	....	....	1.00
Sulfuric Acid, 10 N.	....	....	1.00
Sulfuric Acid Reagent (Periodate Method)	....	.75	1.50
Sulphuric Acid Concentrated—See Acid Sulphuric, Chemical List.			
Sulfuric Acid Digestion Mixture	....	.50	1.00
Sulfuric Acid—Manganous Sulfate Solution	....	.60	1.25
Takayama Solution (Stability 1-2 months)	.50	1.00	3.00
Thiocyanate Solution, 0.02 N (Stability two weeks)	....	.60	1.00
Thionin, 1% Aq. Solution	.35	.75	2.00
Thymol Solution, 5% Alc.	.35	.75	2.00
Thymol Blue, 0.04% Alc. Solution	.40	1.00	3.00
Thymol Blue, 0.04% Aq. Solution	.40	1.00	3.00
Thymolphthalein Solution	.35	.75	2.00
Toisson's Solution	.30	.60	1.50
Topfer's Indicator	.30	.50	1.65
Trichlor Acetic Acid Solution, 5% (For estimation of non-protein Nitrogen)	....	.60	1.00
Trichloracetic Acid, 10%	....	.75	1.25
Trichloracetic Acid, 20%	....	.90	1.50
Trichloracetic Acid, 25%	....	.95	1.65
Trinitrobenzene Solution	.35	.75	2.00
Trisodium Phosphate, 5%	....	.60	.90
Tropaolin OO Solution	.30	.50	1.65
Tsuchiya's Reagent (Albumin)	.35	.80	2.50
Tungstic Acid Solution	.35	.75	1.50
Turk's Solution (For White Corpuscles)	.30	.60	1.50
Turmeric Solution	.30	.50	1.65
Tyrosine Standard Solution (Wu & Ling Method) (250 ml. = 50 mg. Tyrosine)	....	.60	1.00
Tannin, 10%	....	.75	1.50
Universal Indicator Solution, Bogen's—See Bogen.			
Uranium Acetate Standard Solution (1 ml. = 0.005 g. P_2O_5)	....	1.00	3.00
Urea Nitrogen Standard (5 ml. = 0.075 mg. Urea Nitrogen)	....	.60	1.00
Urea Nitrogen Stock Solution (5 ml. = 1.5 mg. Urea Nitrogen)	....	.60	1.00
Urea Nitrogen Standard Solution (1 ml. = 0.015 mg. Urea Nitrogen)	....	.60	1.00
Urea Solution, 3%	....	.50	.90
Urease Powder—See Chemical List.			
Urease Tablets 0.1 g.—See Chemical List.			
Uric Acid Reagent, Benedict's New (For Uric Acid in Blood and Urine)	....	.55	1.75
Uric Acid Reagent, Improved (Folin) (Also known as Phosphotungstic Acid Reagent)	....	.90	3.00
Uric Acid Reagent (Folin-Dennis)	....	.55	1.75
Uric Acid Standard Stock Solution (5 ml. = 1 mg. Uric Acid)	....	.60	1.25
Uric Acid Standard Stock Solution (Brown Method) (1 ml. = 1 mg. Uric Acid)	....	.60	1.25
Uric Acid Standard Stock Solution (Benedict) (1 ml. = 0.2 mg. Uric Acid) (Stability 2 months)	....	.60	1.25
Uric Acid Standard Solution (Benedict) (5 ml. = 0.02 mg. Uric Acid) (Stability 2 weeks)	....	.60	1.25
Uric Acid Standard Solution (Benedict) (3 ml. = 0.012 mg. Uric Acid) (Stability 2 weeks)	....	.60	1.25
Uric Acid Standard Solution (Brown Method) (5 ml. = 0.025 mg. Uric Acid)	....	.60	1.25
Uric Acid Standard Stock Solution (Folin) (1 ml. = 1 mg. Uric Acid)	....	.60	1.25
Uric Acid Standard Solution (5 ml. = 0.02 mg. Uric Acid)	....	.60	1.25
Uric Acid Standard Solution (5 ml. = 0.5 mg. Uric Acid)	....	.60	1.25
Uric Acid Standard Solution (Benedict) (10 ml. = 0.2 mg. Uric Acid) (Stability 10 days to 2 weeks)	....	.60	1.25
Van den Bergh Reagent for Bilirubin in Blood Solution A	....	.75	1.50
Van den Bergh Reagent for Bilirubin in Blood Solution B	....	.75	1.50
Van den Bergh Reagent for Bilirubin in Blood-Cobalt Standard Solution	....	.90	2.00
Vesuvin, 1% Aq. Solution—See Bismark Browm.			
Weigert's Stain	.30	.50	1.65
Whitney's Reagent	....	.60	1.50
Wilson's Blood Stain	.50	1.25	4.00
Wright's Blood Stain	.50	1.25	4.00

	1 oz.	4 oz.	1 lb.
Zenker's Fluid	....	$ .60	$1.75
Zinc Acetate, Alc. Saturated	....	.80	2.50
Zinc Chloride, Sat. Alc. Solution	....	.80	2.50
Zinc Chloride, 30%	....	.40	.90
Zinc Lactate, N/10	....	....	2.75
Zinc Sulfate, 0.45%	....	.45	.90
Zinc Sulfate, 1.8%	....	.45	.90
Zinc Sulfate, 10%	....	.45	.90
Zinc Sulfate, Saturated	....	.45	.90

DEHYDRATED CULTURE MEDIA

Media for Water and Milk Examination

"Standard Methods" Media of American Public Health Association

	¼-lb. Bottle	1-lb Bottle
Nutrient Agar, Dehydrated, 23 g. bottle (makes 1 liter)....$ .70	$2.25	$8.00
Nutrient Broth, Dehydrated, 8 gr. bottle (makes 1 liter) $ .45	2.25	8.00
Lactose Broth, Dehydrated, 13 g. bottle (makes 1 liter)....$ .50	2.05	7.25
Eosin Methylene Blue Agar, 37.5 g. bottle (makes 1 liter)....$ .90	2.05	7.25
Endo's Agar, Dehydrated, 41.5 g. bottle (makes 1 liter)....$1.25	2.25	8.00
Brilliant Green Bile 2%, Dehydrated, 40 g. bottle (makes 1 liter....$1.05	1.65	5.75
Crystal Violet Lactose Broth, Dehydrated, 16 g. bottle (makes 1 liter)....$ .55	1.90	6.50
Formate Ricinoleate Broth, Dehydrated, 16 g. bottle (makes 1 liter)....$ .55	1.90	6.50
Fuchsin Lactose Broth, Dehydrated, 13 g. bottle (makes 1 liter)....$ .55	2.25	8.00
Nutrient Gelatin, Dehydrated, 128 g. bottle (makes 1 liter)....$1.60	1.40	4.75
Yeast Dextrose Agar, Dehydrated, 27.5 g. bottle (makes 1 liter)....$ .80	2.25	8.00

Supplementary Media for Water Examination

	¼-lb. Bottle	1-lb Bottle
Brilliant Green Lactose Bile Agar, Dehydrated. Use 20.6 g. per liter	2.25	8.00
Violet Red Bile Agar, Dehydrated—See supplementary media for milk examination.		
Koser Citrate Medium, Dehydrated. Use 5.7 g. per liter	2.05	7.25
Simmon's Citrate Agar, Dehydrated. Use 29 g. per liter	3.25	12.00
Salle Dye Agar, Dehydrated. Use 39.2 g. per liter	2.25	8.00
M.R.-V.P. Medium, Dehydrated. Use 17 g. per liter	2.70	9.50
Eijkman Medium, Dehydrated. Use 28.5 g. per liter	2.05	7.25
Brilliant Green Bile 5%, Dehydrated. Use 70 g. per liter	1.80	6.25
Lactose Peptone Bile, Dehydrated. Use 70 g. per liter	1.75	6.00
MacConkey's Broth, Dehydrated. Use 35 g. per liter	1.80	6.25
M. B.-B.C.P. Medium, Dehydrated. Use 18.3 g. per liter	1.75	6.00
Neutral Red Medium, Dehydrated. Use 44 g. per liter	2.25	8.00

Supplementary Media for Milk Examination

	¼-lb. Bottle	1-lb Bottle
Proteose Tryptone Agar, Dehydrated. Use 34 g. per liter	2.05	7.25
Violet Red Bile Agar, Dehydrated. Use 41 g. per liter	1.55	5.25
Malt Agar, Dehydrated. Use 45 g. per liter	1.55	5.25
Beef Lactose Agar, Dehydrated Use 45 g. per liter.	2.55	9.00
Purple Bile Salt Agar, Dehydrated. Use 55 g. per liter	2.25	8.00
Nutritive Caseinate Agar, Dehydrated. Use 22 g. per liter	2.55	9.00
Cooledge Broth, Dehydrated. Use 18 g. per liter	2.75	10.00
Gentian Violet Lactose Bile, Hydrated. Use 30 g. per liter	1.75	6.00

Media for Lactic Acid Forming Bacteria

	¼-lb. Bottle	1-lb Bottle
Trypsin Digest Agar, Dehydrated. Use 59 g. per liter	2.05	7.25
Tomato Juice Agar, Dehydrated. Use 51 g. per liter	2.05	7.25
Galactose Whey Agar, Dehydrated. Use 65 g. per liter	2.05	7.25
Galactose Peptonized Milk, Dehydrated. Use 30 g. per liter	2.75	10.00
Whey Agar, Dehydrated. Use 40 g. per liter	2.55	9.00
Whey Broth, Dehydrated. Use 30 g. per liter	2.25	8.00
Peptonized Milk, Dehydrated. Use 15 g. per liter	1.75	6.00
Peptonized Milk Agar, Dehydrated. Use 27 g. per liter	2.05	7.25
Skimmed Milk, Dehydrated. Use 105 g. per liter	.80	2.10

SEROLOGICAL REAGENTS

For Complement-Fixation Tests

	3 ml. Bottle	5 ml. Bottle	10 ml. Bottle	25 ml. Bottle
Bacto-Kolmer Antigen	....	$3.50	....	$10.00
Bacto-Komer Antigen (New)	...	3.50	....	10.00
Bacto-Eagle Wasserman Antigen	....	1.50	....	6.50
Bacto-Alcoholic Antigen	....	2.00	....	7.50
Bacto-Cholesterolized Antigen	....	2.00	....	7.50
Bacto-Antisheep Hemolysen (Amboceptor)	$5.00	....	$15.00	....

For Precipitation Tests

	3 ml. Bottle	5 ml. Bottle	10 ml. Bottle	25 ml. Bottle
Bacto-Kahn Standard Antigen	....	1.50	2.75	6.50
Bacto-Kahn Sensitized Antigen	....	1.50	2.75	6.50
Bacto-Eagle Flocculation Antigen	....	1.50	....	6.50
Bacto-Hinton Indicator	....	1.50	....	6.50

For Preparation of Antigens

	1 gram Bottle	5 gram Bottle	10 gram Bottle	25 gram Bottle	100 gram Bottle
Bacto-Cholesterol	$ .50	$ .75	$1.00	$2.00	$7.00
Bacto-Corn Germ Sterol	1.25	5.00	....	....	....

ORGANIC CHEMICALS

Standard packages are as listed. Prices for smaller quantities will be proportional.

Acetal BP 102-104°	**1 kg.**	**$10.45**
Acetoacetanilide MP 84-85°	**1 kg.**	**2.60**
Acetophenone MP 19-20°	**1 kg.**	**4.50**
Aconitic Acid	**25 g.**	**2.70**
β-Alanine MP 198-200° dec	**10 g.**	**9.95**
***dl*-Alanine**	**100 g.**	**5.50**
Allantoin	**100 g.**	**8.90**
Allyl Bromide BP 69-71°	**1 kg.**	**12.00**
Allyl Cyanide—See Vinylactonitrile.		
Allyl Iodide BP 101-103°	**500 g.**	**10.00**
p-Aminoacetanilide MP 161-162°	**500 g.**	**20.00**
o-Aminobenzensulfonic Acid	**10 g.**	**6.30**
ε-Amino-n-caproic Acid MP 201-204°	**10 g.**	**5.95**
1-Amino-2-naphthol Hydrochloride MP 255° dec.	**100 g.**	**9.00**
1-Amino-2-naphthol-4-sulfonic Acid	**500 g.**	**10.00**
p-Aminophenylacetic Acid MP 199-200°	**10 g.**	**2.00**
Ammonium Aurin Tricarboxylate—See Aurin Tricarboxylic Acid Ammonium Salt.		
n-Amly Alcohol (Synthetic) BP 136-139°	**10 g.**	**2.95**
iso-Amyl Alcohol BP 130-132°	**1 kg.**	**3.50**
Tert.-Amyl Alcohol BP 100-102°	**2 kg.**	**6.10**
iso-Amyl Bromide BP 118-120°	**500 g.**	**6.00**
α-n-Amylcinnamaldehyde (pract.)	**1 kg.**	**10.00**
n-Amyl Propionate BP 164-166°	**1 kg.**	**14.90**
Anethole MP 21-22°	**1 kg.**	**6.00**
Anisaldehyde BP 130-131°/15 mm.	**500 g.**	**6.00**
Anisole BP 154-155.5°	**1 kg.**	**15.00**
Anthrone MP 154-155°	**25 g.**	**12.00**
***l*-Arabinose MP 154-156°**	**100 g.**	**28.00**
***d*-Arginine Monohydrochloride**	**10 g.**	**1.50**
***l*-Asparagine**	**100 g.**	**5.45**
Aurin Tricarboxylic Acid (Pract.)	**100 g.**	**4.00**
Aurin Ammonium Salt (Pract.)	**100 g.**	**5.00**
Azelaic Acid MP 105-107°	**100 g.**	**12.00**
Benzalacetone MP 39-40°	**500 g.**	**4.10**
Benzalacetophenone MP 55-57°	**100 g.**	**3.00**
Benzalaniline MP 51-52°	**1 kg.**	**15.00**
Benzanilide MP 160-161°	**100 g.**	**2.50**
Benzidine Acetate	**25 g.**	**.75**
Benzil MP 94-95°	**500 g.**	**12.00**
α-Benzil Dioxime MP 235-237°	**10 g.**	**1.00**
Benzilic Acid MP 150-151°	**100 g.**	**6.50**
Benzoin MP 133-134°	**500 g.**	**10.00**
α-Benzoin Oxime MP 149-151°	**100 g.**	**4.00**
Benzophenone MP 47-48°	**1 kg.**	**4.50**
Benzoyl Piperidine (Pract.) MP 29-33°	**100 g.**	**4.00**
Benzyl Acetate BP 100-102°/10 mm.	**1 kg.**	**6.95**
Benzyl Benzoate MP 18-20°	**1 kg.**	**4.00**
Benzyl Butyrate BP 108-110°/9 mm.	**500 g.**	**7.00**
Benzyl Formate BP 93-94°/20 mm.	**500 g.**	**6.50**
Bornyl Acetate MP 27-28°	**500 g.**	**4.50**
Bromal BP 71-74°/18 mm.	**100 g.**	**5.00**
p-Bromoacetophenone MP 49-50°	**100 g.**	**5.00**
3-Bromo-4-aminotoluene MP 12-13°	**100 g.**	**6.95**
β-Bromoethylphthalimide MP 81-83°	**100 g.**	**4.00**
p-Bromophenacyl Bromide MP 108-110°	**100 g.**	**8.95**
o-Bromophenol MP 4-5°	**100 g.**	**8.90**
p-Bromophenol MP 63-64°	**500 g.**	**10.00**
β-Bromopropionic Acid MP 61-62°	**100 g.**	**7.95**
γ-Bromopropyl Phenyl Ether BP 135-140°/18 mm.	**100 g.**	**4.50**
2-Bromopyridine BP 76-80°/14 mm.	**10 g.**	**3.00**
3-Bromopyridine BP 168-172°	**10 g.**	**3.90**
n-Butyl Acetate BP 123-126°	**1 kg.**	**4.00**
n-Butyl Alcohol BP 116-118°	**3 kg.**	**7.45**
n-Butyl Borate BP 103-106°/8 mm.	**100 g.**	**3.00**
n-Butyl Bromide BP 100-101°	**1 kg.**	**11.00**
iso-Butyl Bromide BP 91-93°	**500 g.**	**10.00**
n-Butyl Butyrate BP 163-166°	**1 kg.**	**13.00**
n-Butyl Nitrite BP 77-79°	**500 g.**	**9.00**
n-Butyl Phosphate BP 154-157°/10 mm.	**1 kg.**	**6.00**
n-Butyraldehyde BP 74-75°	**1 kg.**	**5.50**
Cacotheline	**10 g.**	**1.00**
Carvacrol Pract.	**500 g.**	**3.00**
Cellobiose	**10 g.**	**3.60**
Cellobiose Octaacetate MP 228-229°	**100 g.**	**12.90**
Cetyl Alcohol MP 48-49°	**100 g.**	**4.00**
Cetyl Iodide MP 15-17°	**100 g.**	**13.90**

Chloralose	10 g.	$3.00
Chloracetamide MP 117-118°	100 g.	3.50
p-Chlorobenzaldehyde MP 45-46°	100 g.	12.00
o-Chlorobenzoyl Chloride BP 93-95°/10 mm.	100 g.	7.40
γ-Chlorobutyronitrile BP 93-96°/26 mm.	100 g.	14.90
Chlorohydroquinone (Pract.) MP 110-105°	500 g.	12.50
Chloromethyl Ether BP 58-60°	100 g.	5.00
β-Chloropropionic Acid MP 38-40°	100 g.	8.95
Cinnamaldehyde (Free from Chlorine) BP 119-120°/10 mm.	500 g.	6.50
Cinnamic Acid MP 132-133°	500 g.	7.00
Cinnamyl Alcohol MP 31-33°	500 g.	6.50
Coumarin MP 67-68°	500 g.	8.00
Creatinine	100 g.	14.00
Crotonaldehyde (Pract.)	2 kg.	3.50
Cupferron (Ammonium Nitrosophenylhydroxylamine)	500 g.	15.00
Cyanoacetamide MP 117-118°	100 g.	10.00
Cyclohexyl propene (prices on request).		
***l*-Cystine**	100 g.	10.00

Decamethylene Glycol MP 71-73°	10 g.	2.00
Desoxybenzoin MP 55-56°	100 g.	9.00
Diacetonamine Acid Oxalate MP 123-125°	100 g.	7.00
Diacetone Alcohol BP 62-64°/13 mm.	3 kg.	6.00
Diallylamine BP 108-111°	10 g.	4.90
Diallylcyanamide BP 108-110°/18 mm.	100 g.	13.90
Dibenzalacetone MP 111-112°	100 g.	4.00
Dibenzyl MP 50-51°	500 g.	9.50
9, 10-Dibromoanthracine MP 221-222°	10 g.	1.00
2, 6-Dibromo-4-nitrophenol MP 142°	100 g.	3.50
2, 3-Dibromopropene BP 73-76°/75 mm.	100 g.	12.00
2, 6-Dibromopyridine MP 118-119°	10 g.	3.40
2, 6-Dibromoquinonechloroimide	10 g.	2.95
Di-n-butylcarbinol BP 94-95°/15 mm.	100 g.	30.00
Dibutyl Phthalate BP 339-341°	1 kg.	1.60
s-Dichloroacetone MP 40-41°	100 g.	5.00
β, β′-Dichloroethyl Ether BP 65-67°/15 mm.	3 kg.	7.80
Diethylamine BP 55-56°	500 g.	10.50
Diethylene Glycol Monobutyl Ether (Pract.) BP 118-126°/20 mm.	4 kg.	6.00
Diethylene Glycol Monoethyl Ether (Pract.)	3 kg.	3.00
2, 4-Dihydroxybenzaldehyde MP 135-136°	100 g.	5.00
2, 4-Dihydroxybenzoic Acid MP 226-227° dec.	100 g.	9.00
β, β′-Dihydroxyethyl Sulfide (Pract.)	100 g.	8.00
3, 5-Diiodo-2-hydroxybenzoic Acid MP 235-236°	100 g.	8.00
3, 5 Diiodosalicylic Acid—See 3, 5-Diiodo-2-hydroxybenzoic Acid.		
p-Dimethylaminobenzaldehyde MP 72-73°	100 g.	5.90
Dimethylbenzylcarbinol MP 18-20°	100 g.	9.00
2, 4-Dimethyl-3, 5-dicarbethoxypyrrole MP 134-135°	10 g.	4.00
Dimethyldihydroresorcinol MP 147.5-149°	100 g.	7.00
Dimethyl Ether Hydroquinone	25 g.	6.00
Dimethylglyoxime MP 237-238°	1 kg.	10.50
Dimethyl Phthalate BP 281-282°	1 kg.	1.50
2, 5-Dimethylpyrrole BP 166-168°	10 g.	2.75
2, 4-Dinitroaniline MP 175-176°	1 kg.	9.00
1, 4-Dioxane (Histological)	3 kg.	4.80
1, 4-Dioxane MP 10.5-11°	1 kg.	2.75
1, 4-Dioxane (Pract.) MP 9-11°	3 kg.	3.30
1, 10-Diphenic Acid MP 227-228°	10 g.	2.30
Diphenylacetic Acid MP 144-145°	10 g.	1.95
s-Diphenylcarbazide MP 172-173°	100 g.	10.00
s-Diphenylcarbazone MP 154-156°	10 g.	2.00
4, 5-Diphenylgloxalone MP 319-321°	100 g.	4.50
Diphenylmercury MP 122-124°	10 g.	2.00
β, β′-Diphenylpropiophenone MP 86-89°	10 g.	5.90
Diphenyl Sulfide—See Phenyl Sulfide.		
Diphenyl Triketone MP 68-70°	1 g.	1.00
s-Diphenylurea MP 241-242°	1 kg.	15.00
Di-p-tolylmercury MP 235-239°	10 g.	2.00
iso-Durene MP -26 to -24°	10 g.	6.00

Edestin	100 g.	9.50
Emulsin	100 g.	14.00
Eosin Bluish	10 g.	.75
Eosin Yellowish	10 g.	.90
Epibromohydrin BP 72-75°/85 mm.	100 g.	7.00
Epichlorohydrin BP 115-117°	500 g.	8.00
Erucic Acid MP 31-32°	100 g.	8.00
Ethoxyacetic Acid BP 97-100.5°/7 mm.	100 g.	20.00
Ethyl Acetoacetate BP 78-79°/10 mm.	1 kg.	3.00
Ethyl Acetoacetate (Pract.) BP 70-78°/15 mm.	3 kg.	4.20
Ethyl Acetonedicarboxylate BP 135-137°/12 mm.	100 g.	11.00
Ethyl Acetopyruvate MP 17-18°	100 g.	12.00

Ethyl Anthranilate BP 135-136°/12 mm.	100 g.	$4.00
Ethyl Benzoate BP 92-94°/20 mm.	1 kg.	4.50
Ethyl Benzoylformate BP 138-140°/15 mm.	100 g.	16.00
Ethyl Bromomalonate BP 125-127°/15 mm.	100 g.	5.00
Ethyl β-Bromopropionate BP 72-75°/15 mm.	100 g.	9.00
Ethyl n-Butymalonate BP 108-110°/10 mm.	100 g.	7.00
Ethyl Cinnamate MP 5-6°	500 g.	6.00
Ethylene Chlorohydrin BP 127.5-128.5°	1 kg.	5.50
Ethylene Chlorohydrin (40%) (Tech.)	3 kg.	3.90
Ethylenediamine (60%) (Pract.)	1 kg.	3.50
Ethylene Glycol Monobutyl Ether (Pract.) B.P. 67-75°/12 mm.	5 kg.	6.50
Ethylene Glycol Monomethyl Ether (Pract.) BP 118-132°	5 kg.	5.50
Ethyl N-Mtheylcarbamate BP 160-165°	100 g.	4.00
Ethyl Oxalate BP 72-74°/10 mm.	1 kg.	2.00
Ethyl Propane-α, α, β, γ-tetra carboxylate BP 182-183°/18 mm.	100 g.	4.00
Ethyl Salicylate BP 114-115°/20 mm.	1 kg.	8.00
Eugenol BP 135-140°/15 mm.	1 kg.	8.50
Furan BP 30-31°	100 g.	9.00
***d*-Glutamic Acid** MP 204-206°	100 g.	3.00
Glutaric Acid MP 95-96°	10 g.	3.50
Glutaronitrile BP 165-167°/32 mm.	100 g.	12.00
Glycerol α, γ-Dibromohydrin BP 88-90°/10 mm.	1 kg.	16.00
α-Glyceryl Penyl Ether MP 48-53°	100 g.	16.00
Glycine (Ammonia free) MP 230-235° dec.	1 kg.	14.00
Heptaldehyde BP 40-42°/10 mm.	1 kg.	9.00
n-Heptaldoxime MP 52-54°	100 g.	6.00
n-Heptyl Alcohol BP 172-176°	100 g.	3.50
n-Heptylamine BP 153-157°	10 g.	3.00
n-Hexadecane MP 16-17°	10 g.	4.90
Hydrazine CP 99.5%-100%	100 g.	35.00
Hydrazobenzene (Pract.) MP. 120-123°	100 g.	7.00
Hydrocinnamic Acid MP 47-49°	100 g.	3.50
p-Hydroxybenzoic Acid MP 214.5-215.5°	500 g.	9.00
β-Hydroxybutyric Acid	25 g.	12.50
Hydroxyhydroquinone Triacetate MP 95-97°	100 g.	8.00
Hydroxylamine Hydrochloride MP 153-155°	1 kg.	15.50
Indole-3-acetic Acid MP 164-165°	1 g.	2.20
Inulin	100 g.	10.00
p-Iodoaniline MP 62-63°	100 g.	15.00
Iodobenzene BP 70-71°/12 mm.	1 kg.	18.00
p-Iodobenzoic Acid MP 269-270°	100 g.	12.00
o-Iodophenol MP 37-45°	100 g.	17.80
Isatin MP 200-201°	10 g.	2.00
Itaconic Acid MP 165-166°	10 g.	2.00
Lauryl Bromide BP 175-180°/45.	100 g.	12.00
***dl*-Leucine**	10 g.	9.80
Levulinic Acid MP 30-31°	100 g.	4.00
***l*-Menthone** BP 204-209°	100 g.	4.50
Mesitylene BP 163-166°	100 g.	6.00
Mesityl Oxide BP 128-130°	1 kg.	4.50
***dl*-Methionine**	1 g.	1.50
Methyl Acetate (Anhydrous) BP 56.5-57°	3 kg.	2.50
Methyl Acetoacetate (Pract.) BP 73-75°/22 mm.	3 kg.	4.80
Methyl n-Amyl Ketone BP 149-150°	1 kg.	4.25
Methyl Benzoate BP 110-111°/25 mm.	1 kg.	5.00
Methyl Cholanthrene	1 g.	6.00
Methyl Cinnamate MP 3-536°	500 g.	5.00
Methyleneaminoacetonitrile MP 128-129°	100 g.	3.00
Methylene Bromide BP 96-98°	100 g.	4.00
Methylene Iodide (D. 3. 3) MP. 5-6°	100 g.	4.50
***dl*-Methylethylacetic Acid** BP 173-176°	100 g.	17.80
α-Methylglucoside (Bacteriological)	10 g.	2.50
Methylhydrazine Sulfate MP 141-142°	10 g.	3.00
Methyl Iodide BP 41-43°	500 g.	6.50
α-Methyl Mannoside MP 192-193°	100 g.	6.00
Methyl β-Naphthyl Ketone MP 53-55°	500 g.	6.50
Methyl m-Nitrobenzoate MP 77-78°	100 g.	3.50
α-Methyl-α-phenylhydrazine BP 116.5-118°/21 mm.	100 g.	15.00
Methyl-iso-propyl Ketone BP 91-93°	100 g.	14.00
1-Methyl-2-pyridone BP 250-252°	10 g.	4.90
Methyl Red (Cryst.) MP 178-179°	100 g.	9.00
Methyl Red Sodium Salt	100 g.	8.00
Methyl Thiophene	25 g.	15.00
Methyl-iso-thiourea Sulfate MP 241-242° dec.	500 g.	10.00
6-Methyluracil MP 320° dec.	100 g.	10.00
Monomethyl ether hydroquinone	25 g.	5.00

Myristic Acid MP 52-53°	100 g.	$3.50
α-Naphthoic Acid MP 159-160°	100 g.	15.00
β-Naphthoic Acid MP 183-185°	10 g.	2.00
β-Naphthol Phenylaminomethane Hydrochloride	100 g.	7.00
α-Naphtholphthaleine	10 g.	6.00
1, 2-Naphthoquinone (Pract.) MP 118-120° dec.	100 g.	9.00
1, 4-Naphthoquinone MP 124-125°	10 g.	4.90
β-Naphthyl Methyl Ether MP 70-72°	1 kg.	5.30
Nicotinic Acid MP 229-230°	100 g.	12.00
m-Nitroacetophenone MP 74-76°	100 g.	7.00
Nitroanthrone MP 140°	25 g.	13.00
Nitrobarbituric Acid MP 181-183° dec.	100 g.	6.00
m-Nitrobenzeneazoresorcinol MP 174-175°	10 g.	1.50
p-Nitrobenzeneazoresorcinol MP 197-198°	10 g.	1.25
p-Nitrobenzoic Acid MP 238-239°	1 kg.	15.00
p-Nitrobenzyl Bromide MP 97-98°	100 g.	5.00
p-Nitrobenzyl Cyanide—See p-Nitrophenylacetonitrile.		
m-Nitrobromobenzene MP 55-56°	100 g.	5.00
m-Nitrochlorobenzene MP 44-45°	100 g.	4.00
m-Nitrocinnamic Acid MP 199-200°	100 g.	6.00
p-Nitrodiphenyl Ether MP 55-58°	100 g.	3.50
Nitromesitylene MP 43-44°	10 g.	1.95
1-Nitro-2-naphthol MP 98-100°	100 g.	17.50
m-Nitrophenol MP 96-97°	100 g.	12.00
p-Nitrophenylacetic Acid MP 152-153°	100 g.	12.00
p-Nitrophenylacetonitrile MP 115-116°	100 g.	4.50
3-Nitrophthalic Acid MP 217-219°	100 g.	4.00
4-Nitrophthalic Acid MP 164-165°	100 g.	8.00
3-Nitrophthalic Anhydride MP 160-162°	100 g.	4.00
4-Nitrophthalimide	100 g.	4.00
α-Nitroso-β-naphthol (Pract.) MP 103.5-105°	1 kg.	13.50
β-Nitroso-α-naphthol MP 162-164° dec.	10 g.	1.00
α-iso-Nitrosopropiophenone MP 113-114°	100 g.	8.00
β-Nitrostyrene (Pract.) MP 54-57°	100 g.	8.00
Nitrourea	100 g.	6.00
n-Nonyl Alcohol BP 97-99°/14 mm.	10 g.	2.35
sec.-Octyl Acetate (Tech.) BP 192-197°	500 g.	12.00
n-Octyl Alcohol (Primary) BP 191-194°	10 g.	3.40
Oleic Acid	500 g.	7.00
Palmitic Acid MP 61-62°	100 g.	5.50
Pentamethylene Chloride BP 64-66°/10 mm.	10 g.	2.90
n-Pentane (Synthetic) BP 34-35.5°	10 g.	2.90
Phenacyl Bromide MP 49-50°	100 g.	6.00
Phenanthrene MP 98.7-99.5°	100 g.	9.80
Phenanthrene (70%) (Tech.)	2 kg.	2.75
Phenylacetic Acid MP 76-77°	500 g.	4.25
Phenylacetic Acid (Pract.)	1 kg.	7.00
Phenylacetonitrile BP 98-100°/8 mm.	500 g.	8.00
Phenylacetylene BP 138-141°	10 g.	3.00
***dl*-β-Phenylalanine** MP 263-265° dec.	10 g.	8.00
Phenylarsonic Acid MP 157-158°	100 g.	8.00
p-Phenylendiamine Dihydrochloride	500 g.	8.00
β-Phenylethyl Acetate BP 111-115°/17 mm.	500 g.	6.00
β-Phenylethyl Alcohol BP 98-101°/8 mm.	500 g.	5.00
Phenylhydrazine MP 18-19°	1 kg.	11.00
Phenylhydrazine Hydrochloride MP 240-241°	500 g.	7.00
β-Phenylhydroxylamine Oxalate MP 120-122° Dec.	100 g.	9.00
Phenyl Isothiocyanate BP 85-86°/12 mm.	100 g.	3.00
Phenylmercuric Nitrate MP 189° dec.	10 g.	1.60
γ-Phenyl-n-propyl Alcohol BP 120-121/12 mm.	500 g.	9.00
Phenylsemicarbazide MP 170-172°	100 g.	15.00
α-Phenylsuccinic Acid MP 166-168°	100 g.	12.00
Phenyl Sulfide BP 151-153°/15 mm.	100 g.	5.00
Phenylthiourea MP 153-154°	100 g.	4.00
Phenylurea MP 147-148°	100 g.	3.50
Phloretine	5 g.	11.00
Phloroglucinol MP 217-218°	100 g.	8l50
Pinacol Hydrate MP 45-47°	100 g.	4.50
Pinacolone BP 103-107°	100 g.	9.00
Propionaldehyde BP 47-49°	1 kg.	7.00
n-Propylbenzene BP 153-157°	10 g.	2.00
Propylene Glycol BP 85-86°/10 mm.	1 kg.	2.50
Propylene Oxide BP 33.4-34.4°	1 kg.	6.00
Pyrrole (Synthetic) BP 128.5-130.5°	100 g.	15.00
Quinoline (Synthetic) BP 110-111°/14mm.	500 g.	10.00
Quinoline Tartrate CP	25 g.	1.15
Quinone MP 112-114°	1 kg.	9.00

β-**Resorcylaldehyde**—See 2 ,4-Dihydroxybenzaldehyde.		
Rhodinol (Pract.)	100 g.	$10.00
Rhodinol (Tech.) BP 94-106°/11 mm.	100 g.	7.00
Rhodinyl Acetate (Tech.) BP 110-116°/10 mm.	100 g.	7.00
Skatole MP 92-94°	10 g.	4.50
Sodium 2-Bromoethanesulfonate (Pract.)	100 g.	6.95
Sodium 2, 6-Dichlorobenzenoneindophenol (Pract.)	1 g.	.95
Sodium Diethyl Dithiocarbamate	100 g.	3.00
Sodium Ethylate liquid 18%	25 g.	.60
Succinic Anhydride MP 115-116°	1 kg.	8.00
dl-**Tartaric Acid**	100 g.	10.00
Taurine	10 g.	4.00
Thioacetic Acid (Pract.) BP 88-92°	100 g.	5.00
Thioglycolic Acid (Pract.)	100 g.	4.00
Thiophene (Synthetic) BP 83-85°	100 g.	15.00
Thiosalicylic Acid (90% plus) (Tech.)	100 g.	8.00
Thiotoluene—See Methyl Thiophene.		
Thymol MP 50-51°	500 g.	3.20
Thymoquinone MP 43-44°	10 g.	5.40
o-Toluamide MP 139-140°	100 g.	13.00
o-Toluic Acid MP 104-105°	100 g.	12.00
o-Tolunitrile BP 93-94°/18 mm.	500 g.	15.00
p-Tolunitrile MP 25-27°	100 g.	4.00
p-Toluyl-o-benzoic Acid MP 130°	100 g.	6.00
Tricarballylic Acid MP 162-163°	10 g.	2.50
Trichloralactic Acid	25 g.	1.90
Triethylcarbinol BP 140-142°	10 g.	2.40
3, 4, 5-Trimethoxybenzoic Acid MP 165-166°	100 g.	7.00
Trimethylamine (Anhydrous)	100 g.	3.50
Trimethylamine (33% in Water)	500 g.	6.00
Trimyristin MP 56-57°	100 g.	13.00
Triphenylamine MP 126-127°	100 g.	10.00
Triphenylmethane MP 93-94°	100 g.	6.00
Triphenylstibine MP 53-54°	100 g.	11.90
l-**Tryptophan**	1 g.	4.00
Uramil	10 g.	5.00
Vanillin MP 81-82°	500 g.	7.50
Veratraldehyde MP 44-45°	100 g.	9.95
Vinylacetonitrile BP 116-120°	100 g.	10.00
Xanthone MP 173-174°	100 g.	8.00
Xanthydrol MP 121-123°	10 g.	1.30
Zinc Ethel	10 g.	5.00

"Spot Test" Reagents

	1/10 gram	1 gram	5 gram
Alizarin (Aluminum, Zirconium, Zircon, Fluorides)	....	$.30	$ .50
p-Aminodimethylaniline Monohydrochloride (Sulfides)	....	.30	.45
Aniline (Mercury, Tin)	....	.25	.30
Benzensulfohydroxamic Acid (Aldehydes)	....	.40	1.00
Benzidine (Lead, Copper, Gold, Thallium, Fluorides, Cerium, Manganese, Chromium, Cyanides, Sulfites, Bromates, Persulfates, Silicates, Phosphates, Permanganates, Sulfur, Silicomolybdates, Phosphorus)	....	.20	.30
Benzimidazole (Cobalt)	....	.40	1.20
α-**Benzoin Oxime** (Copper)	....	.25	.40
Brucine Sulfate (Nitrates)	....	.25	.30
Cacotheline (Tin, Mercury, Vanadium)	....	.25	.70
Carminic Acid (Lead)	....	.45	1.65
Catechol (Titanium)	....	.20	.30
4-Chloro 1, 2-Dimercaptobenzene (Tin)	....	2.00	5.00
Chromotropic Acid—See 1, 8-Dihydroxynaphthalene-3, 6-disulfonic Acid.			
Cinchonine (Bismuth)	....	.25	.40
Cupferron	....	.20	.30
Curcumin (Borates)	....	.70	2.60
Diacetyl Dioxime—See Dimethylglyoxime.			
Diacetyl Monoxime (Hydroxylamine)	....	.30	.40
1, 8-Diaminonaphthalene (Nitric Acid, Selenic Acid)	....	.35	.40
Diazine Green (Tin)	....	.35	.80
Diethylaniline (Zinc)	....	.20	.30
2, 7-Dihydroxynaphthaline (Glycolic Acid, Oxalic Acid)	....	.35	.85
1, 8-Dihydroxynaphthaline-3, 6-disulfonic Acid (Titanium)	....	.30	.40
Dihydroxytartaric Acid Osazone (Sodium Salt)—See Sodium Dihydroxytartaricate Osazone.			
p-Dimethylaminoazophenylarsinic Acid (Zirconium, Fluorides)	....	.35	.95
p-Dimethylaminabenzalrhodamine (Silver, Mercury, Copper, Gold, Palladium)	....	.90	4.25

	1/10 gram	1 gram	5 gram
Dimethylglyoxime (Tin, Vanadium, Nickel, Iron)	....	$ .20	$ .30
Di-β-naphthol (Tartaric Acid)	....	.40	1.20
s-Di-p-nitrophenylcarbazide (Cadmium)	$ .45	2.30	10.00
Diphenylamine (Nitrate)	....	.20	.30
s-Diphenylcarbazide (Mercury, Cadmium, Chromates, Chlorates, Chromium, Magnesium, Hydroxide, Magnesium Carbonates)	....	.30	.65
Diphenylthiocarbazone (Silver, Mercury, Lead, Copper, Zinc)	....	.45	1.40
Dipicrylamine (Potassium)	....	.45	1.20
α, ά-Dipyridyl (Iron)	.60	3.85	18.00
Dithioxamide (Copper, Cobalt, Nickel, Ruthenium)	....	.55	1.75
Dithizone—See Diphenylthiocarbazone.			
Fluorescein (Bromides)	....	.35	.90
Fluorescein Chloride (Primary and Secondary Amines)	....	.40	1.20
Fuchsin R F N Basic (Bromides, Aldehydes)	....	.35	.70
α-Furil Dioxime (Nickel)	....	1.45	6.90
Gallic Acid (Tartrates)	....	.25	.30
Gallocyanine (Lead)	....	.25	.30
2, 2′, 4, 4′, 6, 6′-Hexanitrodiphenylamine—See Dipicrylamine.			
Hydrazine Sulfate	....	.25	.35
o-Hydroxydiphenyl (Lactates, Pyruvates)	....	.25	.30
p-Hydroxydiphenyl (Lactates)	....	.25	.30
Hydroxylamine Hydrochloride (Alcohols, Carboxylic Acids, Carboxylic Acid Anhydrides, Sulfonic Acids)	....	.20	.30
8-Hydroxyquinoline (Vanadium)	....	.25	.40
Malachite Green (Sulfites)	....	.20	.30
4-Methyl 1, 2-dimercaptobenzene (Tin)	....	2.00	5.00
Methyl Iodide (Tertiary Ring Bases)	....	.20	.30
Methyl Sulfate (Tertiary Ring Bases)	....	.25	.30
Naphthalene-1-sulfonic acid-(4-azo-5)-8-hydroxyquinoline (Palladium)	.30	.50	2.40
β-Naphthol (Malates)	....	.25	.30
Naphthoresorcinol (Glycerinic Acid)	.35	1.70	8.00
α-Naphthalamine (Nitrites, Pyridine)	....	.25	.35
Ninhydrin—See Triketohydrindene Hydrate.			
o-Nitrobenzaldehyde (Acetyl, Acetic Acid)	....	.30	.50
p-Nitrobenzeneazochromotropic Acid (p-Nitrobenzeneazo-1, 8-di-hydroxy-naphthalene-3, 6-disulfonic Acid) (Borates)	....	.35	.70
p-Nitrobenzeneazo-a-naphthol (Magnesium)	....	.25	.55
p-Nitrobenzeneazoorcinol (Beryllium)	....	.40	1.10
p-Nitrobenzeneazoresorcinol (Magnesium)	....	.30	.75
α-Nitroso-β-naphthol (Cobalt)	....	.20	.30
β-Nitroso-α-naphthol (Cobalt, Zirconium)	....	.30	.70
Phenolphthalein	....	.20	.30
Phenylhydrazine (Molybdenum)	....	.25	.30
Potassium Ethyl Xanthate (Molybdenum)	....	.25	.50
Potassium Xanthogenate—See Potassium Ethyl Xanthate.			
Purpurin (Boric Acid)	....	.35	.75
4-Pyridylpyridinium Dichloride (Primary Aromatic Amines)	....	.55	1.75
Pyrrole (Tellurites, Tellurates)	....	.35	.95
Quinalizarin (Aluminum, Beryllium, Magnesium, Borates)	....	.40	1.20
Resorcinol (1:2-Dicarboxylic Acids)	....	.25	.35
Rhodamine B (Antimony)	....	.25	.35
Rhodizonic Acid (Sodium Salt)—See Sodium Rhodizonate.			
Salicylaldehyde (Hydrazine, Hydroxylamine)	....	.25	.30
Salicylaldoxime (Copper)	....	.35	.90
Sodium Alizarinsulfonate (Alumium, Fluorides, Borates, Mercury)	....	.30	.60
Sodium Dihydroxytartrate Osazone (Calcium)	....	.45	1.45
Sodium Hydrosulfite	....	.25	.30
Sodium β-Naphthoquinone-4-sulfonate (Active Primary Amino and Methylene Groups, Tertiary Rings Bases)	....	.30	.60
Sodium Nitroprusside (Sulfides, Sulfites, Methyl Ketones, Acrolein, Glycerol)	....	.25	.35
Sodium Rhodizonate (Barium, Strontium, Sulfuric Acid)	.95	9.00	....
Sulfanilic Acid (Nitrites)	....	.25	.30
Tetrabase—See Tetramethyldiaminodiphenylmethane.			
1, 2, 5, 8-Tetrahydroxyanthraquinone—See Quinalizarin.			
Tetramethyldiaminadiphenylmethane (Manganese, Periodates)	....	.25	.30
Thionyl Chloride (Carboxylic Acids, Sulfonic Acids, Cirtic Acids, Pyridine)	....	.25	.30
Thiourea (Selenites)	....	.25	.30
Titan Yellow (Magnesium)	....	.40	1.00
Triketohydrindene Hydrate	.35	1.50	....
Urea (Ketohexoses, Urease)	....	.25	.30

ROCKS AND MINERALS

(IN BULK)

Name	¼-Lb.	1-Lb.	5 Lbs.
Agate	$ .75	$2.00	....
Alabaster (White Gypsum)	.18	.25	$1.00
Ablite (Sodic Feldspar)	.20	.40	....
Almandite Garnet	.20	.35	1.25
Anthracite Coal	....	.20	.70
Antimonite (Stibnite)	.75	2.00	....
Apatite (Phosphate Rock), green	.20	.50	....
Arsenopyrite (Mispickel)	.20	.50	....
Asbestos, Chrysotile	.30	.90	....
Asphaltum, Native, lumps	....	.35	....
Barite	....	.40	....
Basalt	....	.20	.70
Bauxite	....	.40	....
Beryl, white	....	.40	....
Biotite (black Mica)	.15	.45	1.80
Bituminous Coal	....	.20	.70
Bornite, medium grade	.30	.90	....
Calamine	.15	.50	....
Calcite, Crystalline	....	.20	.70
Calcite, cleavable	.15	.45	1.80
Calcareous Tufa (petrified moss)	....	.20	.70
Cannel Coal	....	.20	.70
Carnotite, (Radium Ore) ground	.80	2.50	....
Cassiterite (Tin stone) in Albite	.30	.80	....
Chalcedony	.15	.45	1.50
Chalcopyrite	.35	.95	....
Chalk, Native lumps	....	.25	....
China Clay (Kaolinite), native lumps	....	.30	....
Chromite	.15	.35	1.35
Chrysolite (Olivene)	.20	.45	....
Cinnabar	.90	3.00	....
Conglomerate	....	.25	.90
Copper, native pieces	.25	.70	....
Corundum (Emery)	.20	.50	2.30
Cryolite	.50	1.20	....
Crystal Quartz, clear	.35	1.35	....
Dolomite (Magnesium Limestone)	....	.20	.70
Emery (Corundum)	....	.50	....
Feldspar, Potassic Pink	.20	.35	1.35
Feldspar, Potassic White	.25	.50	....
Feldspar, Sodic (Albite)	.20	.40	....
Flint	....	.20	.70
Fluorite (Fluorspar)	.15	.35	1.35
Fossiliferous Limestone	....	.20	.70
Galena, cleavable, lumps	.20	.40	1.80
Garnet (Almandite)	.20	.35	1.25
Glacial Pebbles, strong markings	....	.25	.90
Gneiss (Banded Granite)	....	.20	.70
Gold Quartz	.15	.60	....
Granite, black (Porphyry)	....	.25	.90
Granite, gray	....	.20	.70
Granite, red	....	.20	.70
Granite, large crystals	....	.25	.90
Granite, weathered	....	.25	.90
Graphite, lumps	....	.35	1.35
Gypsum, pink	.20	.50	....
Gypsum, White (Alabaster)	.15	.35	1.00
Gypsum, White (Satinspar)	.25	.65	....
Gypsum, Clear Plates (Selenite)	.25	.70	....
Halite (Rock Salt), lumps	....	.20	.70
Hematite, massive (Red Iron Ore)	....	.20	.70
Hornblende	....	.20	.70
Iceland Spar, for standardizing	.45	1.20	....
Iceland Spar, Optical, showing double refraction......oz., **$ .40**	....	....	....
Iron Pyrites, massive	....	.30	1.10
Iron Pyrites, crystallized	.20	.50	2.10
Kaolinite (China Clay)	....	.30	....
Lava Rock	....	.50	....

Name	¼-Lb.	1-Lb.	5 Lbs.
Lignite	....	$ .20	$ .70
Limestone, massive	....	.20	.70
Limestone, fossiliferrous	....	.20	.70
Limestone, Oolitic	....	.20	.70
Limestone, gray, Ordovician	....	.20	.70
Limestone, Lithographic, very dense	....	.20	.70
Limonite (Brown Iron Ore)	....	.40	....
Lodestone, Magnetic, strong	$ .20	.60	2.50
Magnesite	....	.40	1.60
Magnetite, Magnetic (Lodestone)	.20	.60	2.50
Malachite	.30	.90	....
Marble, red	....	.20	.70
Marble, white	....	.20	.70
Marble, crystalline, Georgia	....	.20	.70
Mexican Onyx	....	.25	.90
Mica, black (Biotite)	.20	.45	1.85
Mica Schist	....	.20	.70
Mica, white (Muscovite)	....	.30	1.10
Milky Quartz	....	.25	.90
Obsidian (Volcanic Glass)	.20	.50	....
Onyx, Mexican	....	.25	.90
Orthoclase, pink	.20	.35	1.35
Orthoclase, white	.25	.50	....
Peat	....	.20	.70
Phosphate Rock (Apatite)	.20	.50	....
Plumbago (Graphite), lumps	....	.35	1.35
Pumice Stone, lumps	....	.30	....
Pyrolusite	.15	.45	2.00
Quartz, Agate	.75	2.00	....
Quartz, Chalcedony	.15	.45	1.50
Quartz, clear crystals	.35	1.20	....
Quartz, flint	....	.20	.70
Quartz, gold Quartz	.20	.50	....
Quartz, milky	....	.25	.90
Quartz, Rose Quartz, medium	.20	.50	2.00
Quartz, Smoky, massive	....	.25	.90
Quartz, Smoky, crystal	.20	.50	2.10
Quartzite	....	.20	.70
Radium Ore, Carnotite, ground	.80	2.50	....
Rock Salt (Halite)	....	.20	.70
Rose Quartz, medium	.15	.40	1.50
Rutile	.15	.40	1.50
Sandstone, grey	....	.20	.70
Sandstone, chocolate brown, hard	....	.20	.70
Sandstone, red	....	.20	.70
Sandstone, red, banded	....	.25	.90
Sandstone, yellow, soft, Friable	....	.20	.70
Satinspar	.25	.65	....
Selenite, clear plates	.25	.70	....
Serpentine, green	....	.20	.70
Shale	....	.20	.70
Shale, Kerosene (Canned Coal)	....	.20	.70
Siderite	....	.50	....
Slate, green	....	.20	.70
Slate, red	....	.20	.70
Smithsonite	.20	.55	2.10
Smoky Quartz, massive	..	.25	.90
Smoky Quartz, crystals	.20	.55	2.10
Soapstone, native talc	....	.30	1.10
Sphalerite (Zinc Blende)	.25	.65	2.80
Stibnite (Antimonite)	.75	2.00	....
Sulphur, Crystallized	....	.25	.90
Talc, native lump	....	.30	1.10
Tin Stone (Cassiterite in Albite)	.30	.80	....
Witherite	.20	.55	....
Wolframite	.55	1.70	7.80
Wood Petrified	.25	.85	....
Zinz Blende (Sphalerite)	.25	.65	2.80
Zincite, nearly pure, **per oz., $** .75	2.45	....	....

Note: Mineral Collections on pages 271 and 272.

USEFUL INFORMATION

A List of Minerals, Their Description and Specific Gravity

			Spec. Grav.
Aluminum	Al		2.60
Andalusite	Al_2SiO_5	Silicate of Aluminum	3.16-3.20
Anglesite	$PbSO_4$	Lead Sulphate	6.12-6.39
Anthracite		Hard Coal	1.32-1.70
Antimony	Sb		6.71
Apatite	$3Ca_3P_2O_8, CaF_2$	Phosphate of Lime	3.17-3.23
Aragonite	$CaCO_3$	Carbonate " "	2.94
Argentite	Ag_2S	Silver glance	7.20-7.36
Arsenic	As		5.78
Arsenolite	As_2O_3	White Arsenic	3.70-3.72
Asphaltum			1.00-1.80
Atacamite	$CuCl_23Cu(OH)_2$	Oxychloride of Copper	3.75
Azurite	$Cu_3(OH)_2(CO_3)_2$	Blue Carbonate of Copper	3.77-3.83
Barite	$BaSO_4$	Heavy Spar	4.30-4.60
Bauxite	$Al_2O_32H_2O$	Hydrate Oxide of Aluminum	2.55
Beryl	$Be_3Al_2Si_6O_{18}$	Emerald or Silicate of Beryllium	2.63-2.80
Biotite		Magnesia-iron Mica	2.70-3.10
Bismuth	Bi		9.80
Bismuthinite	Bi_2S_3	Bismuth glance	6.40-6.50
Bituminous Coal		Soft Coal	1.14-1.40
Bornite	Cu_2FeS_3	Purple Copper	4.90-5.40
Cadmium	Cd		8.60
Calamine	$H_2Zn_2SiO_5$	Silicate of Zinc	3.40-3.50
Calcite	$CaCO_3$	Calc-spar	2.70
Cassiterite	SnO_2	Tin Stone	6.80-7.10
Cerargyrite	$AgCl$	Horn Silver	5.55
Cerussite	$PbCO_3$	White Lead ore	6.46-6.57
Chalcocite	Cu_2S	Copper Glance	5.50-5.80
Chalcopyrite	$CuFeS_2$	" Pyrite	4.10-4.30
Chromite	$FeCr_2O_4$	Chromic Iron	4.32-4.57
Chromium	Cr		6.50
Chrysolite	$(MgFe)_2SiO_4$	Olivine or Peridot	3.27-3.37
Cinnabar	HgS	Sulphide of Mercury	8.00-8.20
Cobalt			8.60
Cobaltite	$CoAsS$	Cobalt glance	6.00-6.30
Copper	Cu		8.80-8.90
Corundum	Al_2O_3	Emery or sapphire	3.95-4.10
Cryolite	Na_3AlF_6	Fluoride of Aluminum and Sodium	3.00
Cuprite	Cu_2O	Red Copper Ore	5.85-6.15
Cyanite	Al_2SiO_5	Aluminum Silicate	3.56-3.67
Diamond	C		3.50
Dolomite	$(CaMg)CO_3$	Carbonate of Lime and Magnesia	2.80-2.90
Enargite	Cu_3AsS_4		4.45
Epidote	$HCa_2(AlFe)_3Si_3O_{13}$	Silicate of Iron Alumina and Lime	3.25-3.50
Fluorite	CaF_2	Fluor Spar	3.20
Franklinite		Oxide of Zinc, Manganese and Iron	5.07-5.22
Galena	PbS	Lead Glance	7.43
Garnet			3.15-4.30
Gold	Au		15.6-19.30
Graphite	C		2.09-2.23
Gypsum	$CaSO_4+2H_2O$	Sulphate of Lime	2.30
Hematite	Fe_2O_3	Red Oxide of Iron	4.90-5.30
Ice	H_2O		0.916
Iodyrite	AgI	Iodide of Silver	5.60-5.70
Iridium	Ir		22.42
Iron	Fe		7.86
Kaolinite	$2H_2OAl_2O_32SiO_2$	China clay	2.60
Lead	Pb		11.37
Limonite	$2Fe_2O_33H_2O$	Brown Hematite	3.60-4.00
Magnesite	$MgCO_3$	Carbonate of Magnesia	3.00-3.12
Magnetite	FeO, Fe_2O_3	Magnetic Oxide of Iron	5.16-5.18
Malachite	$Cu_2(OH)_2CO_3$	Green Carbonate of Copper	3.90-4.00
Manganese	Mn		7.39
Manganite	$Mn_2O_3H_2O$	Hydrate Manganese Oxide	4.20-4.40
Monazite			4.80-5.10
Marcasite	FeS_3	White Iron Pyrite	4.85-4.90
Mercury	Hg		13.60
Millerite	NiS	Nickel Sulphide	5.30-5.60
Mimetite	$3Pb_3As_2O_8PbCl_2$	Lead Arsenate	7.00-7.25
Muscovite	$H_2KAl_3(SiO_4)_3$	Potash Mica	2.76-3.00
Naphtha			0.60-0.75
Niccolite	$NiAs$	Copper Nickel	7.33-7.67
Nickel	Ni		8.90
Opal	SiO_2nH_2O		1.90-2.30
Orpiment	As_2S_3	Yellow Sulphide of Arsenic	3.40-3.50
Orthoclase	$KAlSi_3O_8$	Potash Feldspar	2.46-2.60
Ozocerite		Mineral Wax	0.85-0.90
Palladium	Pd		11.3-11.80
Platinum	Pt		14.0-19.00
Proustite	Ag_3AsS_3	Light Red Silver Ore	5.57-5.64
Pyrargyrite	Ag_3SbS_3	Dark Red Silver Ore	5.57-5.86
Pyrite	FeS_2	Iron Sulphide	4.95-5.10
Pyrolusite	MnO_2	Dioxide of Manganese	4.82
Pyromorphite	$3Pb_3P_2O_8PbCl_2$	Lead Phosphate	6.50-7.10
Pyrrhotite	$Fe_{11}S_{12}$	Magnetic Pyrite	4.58-4.64
Quartz	SiO_2		2.65-2.66
Realgar	AsS	Red Sulphide of Arsenic	3.55
Rhodochrosite	$MnCO_3$	Carbonate of Manganese	3.45-3.60
Rhodonite	$MnSiO_3$	Silicate of Manganese	3.40-3.68
Rutile	TiO_3	Dioxide of Titanium	4.20
Serpentine	$H_4Mg_3Si_2O_9$	Silicate of Magnesia	2.50-2.65
Siderite	$FeCO_3$	Carbonate of Iron	3.80-3.90
Silver	Ag		10.1-11.10
Smaltite	$CoAs_2$	Arsenide of Cobalt	6.40-6.60
Smithsonite	$ZnCO_3$	Dry Bone	4.30-4.45
Sphalerite	ZnS	Black Jack or Blend	3.90-4.00
Spinel	$MgAl_2O_4$	Aluminate of Magnesia	3.50-4.10
Stephanite	Ag_5S_4Sb	Brittle Silver	6.20-6.30
Stibnite	Sb_2S_3	Antimony Glance	4.50-4.60
Sulphur	S		2.08
Sylvanite	$(Au, Ag)Te_2$	Telluride of Gold and Silver	7.90-8.30
Talc	$H_2Mg_3Si_4O_{12}$	Soapstone	2.70-2.80
Tephroite	Mn_2SiO_4	Silicate of Manganese	4.00-4.10
Tetrahedrite	$4Cu_2S, Sb_2S_3$	Gray Copper	4.40-5.10
Tin	Sn		7.29
Topaz		Fluo-silicate of Alumina	3.40-3.60
Tourmaline		Silicate of Alumina Iron and Magnesia.	2.98-3.20
Willemite	Zn_2SiO_4	Silicate of Zinc	3.90-4.18
Wolframite	$(Fe, Mn)WO_4$	Tungstate of Iron and Manganese	7.20-7.50
Wulfenite	$PbMoO_4$	Molybdate of Lead	6.70-7.00
Zinc	Zn		7.15
Zincite	ZnO	Red Zinc Oxide	5.43-5.70
Zircon	$ZrSiO_4$	Silicate of Zirconium	4.70

Useful Information

Pulp Density Tables

Specific Gravity Cubic feet per ton		2.6 12.31			3.0 10.67			3.4 9.41			3.8 8.42			4.2 7.62		
% Solids	Solids to Solution	Specific Gravity	Total Vol.	Cond. Factor	Specific Gravity	Total Vol.	Cond. Factor	Specific Gravity	Total Vol.	Cond. Factor	Specific Gravity	Total Vol.	Cond. Factor	Specific Gravity	Total Vol.	Cond. Factor
5	1 :19.00	1032	620.31	.4308	1035	618.67	.4296	1037	617.41	.4288	1038	616.42	.4280	1040	615.62	.4275
6	1 :15.67	1036	513.75	.3568	1042	512.11	.3556	1044	510.85	.3547	1046	509.86	.3541	1048	509.06	.3535
7	1 :13.29	1045	437.59	.3039	1049	435.95	.3027	1052	434.69	.3019	1054	433.70	.3012	1056	432.90	.3006
8	1 :11.50	1052	380.31	.2641	1056	378.67	.2630	1060	377.41	.2621	1063	376.42	.2614	1065	375.62	.2608
9	1 :10.11	1059	335.83	.2332	1064	334.19	.2321	1068	332.93	.2312	1071	331.94	.2305	1074	331.14	.2300
10	1 : 9.00	1065	300.31	.2085	1071	298.67	.2074	1076	297.41	.2065	1080	296.42	.2058	1082	295.62	.2053
11	1 : 8.09	1073	271.19	.1883	1078	269.55	.1872	1084	268.29	.1863	1088	267.30	.1856	1091	266.50	.1851
12	1 : 7.33	1080	246.87	.1714	1087	245.23	.1703	1093	243.97	.1694	1097	247.98	.1687	1101	242.18	.1682
13	1 : 6.69	1087	226.39	.1572	1095	224.75	.1561	1101	223.49	.1552	1106	222.50	.1545	1110	221.70	.1540
14	1 : 6.14	1094	208.79	.1450	1103	207.15	.1439	1110	205.89	.1430	1115	204.90	.1423	1119	204.10	.1417
15	1 : 5.67	1102	193.75	.1345	1111	192.11	.1334	1118	190.85	.1325	1124	189.86	.1318	1129	189.06	.1313
16	1 : 5.25	1109	180.31	.1252	1119	178.67	.1241	1127	177.41	.1232	1134	176.42	.1225	1139	175.62	.1220
17	1 : 4.88	1117	168.47	.1170	1128	166.83	.1159	1136	165.57	.1150	1143	164.58	.1143	1149	163.78	.1137
18	1 : 4.56	1125	158.23	.1099	1136	156.59	.1087	1146	155.33	.1079	1153	154.34	.1072	1159	153.54	.1066
19	1 : 4.26	1133	148.63	.1032	1145	146.99	.1021	1155	145.73	.1012	1163	144.74	.1005	1169	143.94	.1000
20	1 : 4.00	1140	140.31	.0974	1154	138.67	.0963	1164	137.41	.0954	1173	136.42	.0947	1180	135.62	.0942
21	1 : 3.76	1148	132.63	.0921	1163	130.99	.0910	1174	129.73	.0901	1183	128.74	.0894	1190	127.94	.0888
22	1 : 3.55	1157	125.91	.0874	1172	124.27	.0863	1184	123.01	.0854	1193	122.02	.0847	1201	121.22	.0842
23	1 : 3.35	1165	119.51	.0830	1181	117.87	.0818	1194	116.61	.0810	1204	115.62	.0803	1212	114.82	.0797
24	1 : 3.17	1173	113.75	.0790	1190	112.11	.0779	1204	110.85	.0770	1215	109.86	.0763	1224	109.06	.0757
25	1 : 3.00	1182	108.31	.0752	1200	106.67	.0741	1214	105.41	.0732	1226	104.42	.0725	1235	103.62	.0720
26	1 : 2.85	1190	103.51	.0719	1210	101.87	.0707	1225	100.61	.0699	1237	99.62	.0692	1247	98.82	.0686
27	1 : 2.70	1199	98.71	.0685	1220	97.07	.0674	1235	95.81	.0665	1248	94.82	.0658	1259	94.02	.0652
28	1 : 2.57	1209	94.55	.0657	1230	92.91	.0645	1246	91.65	.0636	1260	90.66	.0630	1271	89.86	.0624
29	1 : 2.45	1217	90.71	.0630	1240	89.07	.0619	1257	87.81	.0610	1272	86.82	.0603	1284	86.02	.0597
30	1 : 2.33	1226	86.87	.0603	1250	85.23	.0592	1269	83.97	.0583	1284	82.98	.0576	1296	82.18	.0571
31	1 : 2.23	1236	83.67	.0581	1261	82.03	.0570	1280	80.77	.0561	1296	79.78	.0554	1309	78.98	.0548
32	1 : 2.13	1245	80.47	.0559	1271	78.83	.0547	1292	77.57	.0539	1309	76.58	.0532	1322	75.78	.0526
33	1 : 2.03	1255	77.27	.0536	1282	75.63	.0525	1304	74.37	.0516	1321	73.38	.0510	1336	72.58	.0504
34	1 : 1.94	1264	74.39	.0517	1293	72.75	.0505	1316	71.49	.0496	1334	70.50	.0490	1350	69.70	.0484
35	1 : 1.86	1274	71.83	.0499	1304	70.19	.0487	1328	68.93	.0479	1348	67.94	.0472	1364	67.14	.0466
36	1 : 1.78	1284	69.27	.0481	1316	67.63	.0470	1341	66.37	.0461	1361	65.38	.0454	1378	64.58	.0448
37	1 : 1.70	1295	66.71	.0463	1328	65.07	.0452	1354	63.81	.0443	1375	62.82	.0436	1393	62.02	.0431
38	1 : 1.63	1305	64.47	.0448	1340	62.83	.0436	1367	61.57	.0428	1389	60.58	.0421	1408	59.78	.0415
39	1 : 1.56	1316	62.23	.0432	1351	60.59	.0421	1380	59.33	.0412	1403	58.34	.0405	1423	57.54	.0400
40	1 : 1.50	1326	60.31	.0419	1363	58.67	.0407	1393	57.41	.0399	1418	56.42	.0392	1438	55.62	.0386
41	1 : 1.44	1337	58.39	.0405	1376	56.75	.0394	1407	55.49	.0385	1433	54.50	.0378	1454	53.70	.0373
42	1 : 1.38	1348	56.47	.0392	1389	54.83	.0381	1421	53.57	.0372	1448	52.58	.0365	1471	51.78	.0360
43	1 : 1.33	1359	54.87	.0381	1402	53.23	.0370	1436	51.97	.0361	1464	50.98	.0354	1487	50.18	.0348
44	1 : 1.27	1372	52.95	.0368	1415	51.31	.0356	1451	50.05	.0348	1480	49.06	.0341	1504	48.26	.0335
45	1 : 1.22	1383	51.35	.0357	1429	49.71	.0345	1466	48.45	.0336	1496	47.46	.0330	1522	46.66	.0324
46	1 : 1.17	1395	49.75	.0345	1443	48.11	.0334	1481	46.85	.0325	1513	45.86	.0318	1540	45.06	.0313
47	1 : 1.13	1407	48.47	.0337	1457	46.83	.0325	1496	45.57	.0316	1530	44.58	.0310	1558	43.78	.0304
48	1 : 1.08	1419	46.87	.0325	1471	45.23	.0314	1512	43.97	.0305	1547	42.98	.0298	1577	42.18	.0293
49	1 : 1.04	1431	45.59	.0317	1485	43.95	.0305	1529	42.69	.0296	1565	41.70	.0290	1596	40.90	.0284
50	1 : 1.00	1444	44.31	.0308	1500	42.67	.0296	1545	41.41	.0288	1583	40.42	.0281	1615	39.62	.0275
52	1 : 0.92	1471	41.75	.0290	1531	40.11	.0279	1580	38.85	.0270	1621	37.86	.0263	1656	37.06	.0257
54	1 : 0.85	1498	39.51	.0274	1563	37.87	.0263	1616	36.61	.0254	1661	35.62	.0247	1699	34.82	.0242
56	1 : 0.79	1526	37.59	.0261	1596	35.95	.0250	1654	34.69	.0241	1703	33.70	.0234	1744	32.90	.0228
58	1 : 0.72	1555	35.35	.0245	1631	33.71	.0234	1693	32.45	.0225	1746	31.46	.0218	1792	30.66	.0213
60	1 : 0.67	1585	33.75	.0234	1667	32.11	.0223	1735	30.85	.0214	1792	29.86	.0207	1842	29.06	.0202
62	1 : 0.61	1617	31.83	.0221	1705	30.19	.0210	1778	28.93	.0201	1841	27.94	.0194	1895	27.14	.0188
64	1 : 0.56	1650	30.23	.0210	1745	28.59	.0199	1824	27.33	.0190	1892	26.34	.0183	1952	25.54	.0177
66	1 : 0.52	1684	28.95	.0201	1786	27.31	.0190	1872	26.05	.0181	1947	25.06	.0174	2011	24.26	.0168
68	1 : 0.47	1719	27.35	.0190	1830	25.71	.0179	1923	24.45	.0170	2004	23.46	.0163	2075	22.66	.0157
70	1 : 0.43	1757	26.07	.0181	1875	24.43	.0170	1977	23.17	.0161	2065	22.18	.0154	2143	21.38	.0148

Specific Gravity, given as weight in grams, of 1 litre of pulp. **Total Volume**, (in cubic feet) is the volume of 1 ton of solids + necessary volume of water to make a pulp of sp. gr. shown. **Conditioning Factor**—Volume, in Cubic feet, necessary to give 1 minute contact on 1 ton per 24 hours.

The above are reproduced from the Denver Equipment Co. Index.

Pressure Equivalents

1 in. water at 62° F. =
.0833 ft. water at 62° F.
.0736 in. mercury.
.5774 oz. per sq. in.
.03609 lb. per sq. in.

1 ft. water at 62° F. =
.8832 in. mercury.
6.9288 oz. per sq. in.
.43308 lb. per sq. in.

1 in. mercury at 62° F. =
13.58 in. water at 62° F.
1.132 ft. water at 62° F.
7.86 oz. per sq. in.
.491 lb. per sq. in.

1 oz. per sq. in. =
.1276 in. mercury at 62° F.
1.732 in. water at 62° F.

1 lb. per sq. in. =
27.71 in. water at 62° F.
2.309 ft. water at 62° F.
2.0416 in. mercury at 62° F.

1 atmosphere =
33.947 ft. water at 62° F.
30 in. mercury at 62° F.
14.7 lbs. per sq. in.

Useful Information

Correct Names For Common Chemicals

Alumina	Aluminum Oxide
Aqua Fortis	Nitric Acid
Aqua Regia	Nitric and Muriatic Acids
Azurite	Basic Copper Carbonate
Baryta	Barium Oxide
Barytes	Barium Sulphate
Benzene	Benzol
Benzine	Petroleum Ether
Blue Stone	Copper Sulphate
Blue Vitriol	Copper Sulphate
Borax	Sodium Borate
Brimstone	Sulphur.
Butter of Antimony	Antimonious Chloride
Calomel	Mercurous Chloride
Chalk	Calcium Carbonate
Cinnabar	Mercuric Sulphide
Copperas	Iron Sulphate
Corrosive Sublimate	Mercuric Chloride
Cream of Tartar	Potassium Bitartrate
Epsom Salts	Magnesium Sulphate
Fluorspar	Calcium Fluoride
Foler's Solution	Potassium Arsenite
French Chalk	Hydrated Silicate of Magnesium
Glauber's Salts	Sodium Sulphate
Green Vitriol	Iron Sulphate
Gypsum	Calcium Sulphate
Horn Silver	Silver Chloride
Hartshorn	Ammonia Water
Hypo	Sodium Hyposulphite
Kaolin	Aluminum Silicate
Laughing Gas	Nitrous Oxide
Lime	Calcium Oxide
Lime Water	Calcium Hydrate
Litharge	Lead Oxide, Yellow
Lunar Caustic	Silver Nitrate
Liver of Sulphur	Potassium Sulphide
Magnesia	Magnesium Oxide
Magnesite	Magnesium Carbonate
Muriatic Acid	Hydrochloric Acid
Nitre	Potassium Nitrate
Nitre-Cake	Sodium Bisulphate
Oil of Vitriol	Sulphuric Acid
Pearl Ash	Potassium Carbonate
Plaster Paris	Calcium Sulphate
Prussian Blue	Ferric Ferro-Cyanide
Prussic Acid	Hydrocyanic Acid
Pyro	Pyrogallic Acid
Quicklime	Calcium Oxide
Quicksilver	Mercury
Red Lead	Lead Oxide, Red
Red Precipitate	Red Mercuric Oxide
Rochelle Salts	Potassium and Sodium Tartrate
Salt (Common)	Sodium Chloride
Saltpetre	Potassium Nitrate
Salt Cake	Sodium Sulphate
Sal-Ammoniac	Ammonium Chloride
Sal-Soda	Sodium Carbonate, Cryst.
Silica	Silicon Dioxide
Soda Ash	Sodium Carbonate
Spirits of Salt	Muriatic Acid
Sugar of Lead	Lead Acetate
Talc	Soapstone
Tartar Emetic	Antimony and Potassium Tartrate
Verdigris	Copper Sub-Acetate
Vermillion	Red Mercuric Sulphide
Vinegar	Acetic Acid
Water Glass	Sodium Silicate Solution
White Arsenic	Arsenous Oxide
White Lead	Lead Carbonate, Basic
White Precipitate	Mercuric-Ammonium Chloride
White Vitriol	Zinc Sulphate
White Zinc	Zinc Oxide
Whiting	Calcium Carbonate
Xylol	Xylene

Antidotes For Cyanide Poisoning

All cyanides are deadly poisons, but the aqueous solutions used in practice are so dilute that there is little or no danger from the prussic acid evolved from them if the buildings are properly ventilated.

Acids react on Cyanides, liberating Prussic Acid gas which causes almost instant death when inhaled in a pure state. When diluted with air, it causes faintness, dizziness and a depressing frontal headache.

Even very dilute solutions of Cyanide are poisonous when taken internally and when they come in contact with the skin produce in some persons an eruption of painful red boils. In cases where the hands and arms must be brought into contact with the solutions, rubber gloves reaching over the elbows should be provided for the workmen. Kaffir workmen are said to suffer no inconvenience whatsoever from the contact of their skin with Cyanide solutions.

If the poisoning is the result of inhaling Prussic Acid Gas, it is advisable to make the patient inhale a small quantity of chlorine gas, ammonia or ether. The chlorine gas can be quickly made and applied by sprinkling a little bleaching powder on a piece of flannel moistened with Acetic Acid and then holding the flannel to the nostrils of the patient.

Emergency Treatment in Cyanide Poisoning

This remedy consists, first of 7½ grams of Ferrous Sulphate, dissolved in 30 cc of water; second, 1½ grams of Caustic Soda dissolved in 300 cc of water; third, two grams of magnesia. The first and second are to be kept in hermetically sealed bottles.

These three remedies with a rubber stomach tube and a mouth gag should be kept in a tin case 5 inches in diameter, and 7 inches high. There should also be a filtering shelf of finely perforated metal.

Everything Depends Upon Prompt Action

The bottles containing the antidotes can be broken over the filter shelf and emptied into the tin case, the shelf excluding any broken glass. The magnesia is added and the mixture given the patient as soon as possible. If already unconscious, the gag is put in the mouth, the stomach tube inserted and the mixture poured into the stomach.

Before or after the dose the stomach tube may be inserted and about half a pint of water poured down and then syphoned out by lowering the end of the tube. The stomach should be thoroughly washed out and vomiting induced either by mustard or by tickling the throat with a feather, should the tube not be at hand.

As soon as the antidote has been given and the tube withdrawn, artificial respiration should be resorted to as much as in the case of partial drowning or suffocation.

For skin trouble, cuts and bruises, bathe with hydrogen peroxide and cover with vaseline.

A kit as described above is listed in this catalog on page 160.

Useful Information

An Explanation of Hydrogen Ion (pH) Values

The pH scale, 0.0 to 14.0, is used to denote intensity of acidity and alkalinity. The value pH 7.0 is the neutral point; that is, a solution having a pH of 7.0 is neither acid nor alkaline. The numbers below 7.0 denote acidity, the intensity of acidity **increasing** as the numbers **decrease.** Thus, a solution of pH 6.0 is very slightly acid; one of pH 5.0, more strongly acid; and one of pH 4.0, still more strongly acid, etc. On the other hand, the numbers between 7.0 and 14.0 are used to denote alkalinity, the intensity of alkalinity **increasing** as the numbers **increase.** Thus, a solution of pH 8.0 is slightly alkaline; one of pH 9.0, more strongly alkaline; and one of pH 10.0, still more strongly alkaline, etc.

The true acidity or alkalinity of a solution does not depend entirely on the total concentration of acid or alkali present but rather on the concentration that is active. The active acidity or alkalinity is considered as being determined by the concentration of the hydrogen ion. Expression in terms of actual concentration requires the use of fractions with very large denominators. For example, at exact neutrality (pH 7.0) the hydrogen ion concentration is $\frac{1}{10{,}000{,}000}$. Consequently the hydrogen ion concentration is denoted by a negative logarithmic value. pH is usually considered as the logarithm of $\frac{1}{\text{Hydrogen Ion Concentration}}$. Strictly speaking, the pH value is based on a voltage determination by the hydrogen electrode which is the fundamental standard. In the majority of cases the pH value is a measure of the hydrogen ion concentration, but in some cases, notably with strong acids, it does not represent the actual hydrogen ion concentration but another value which is designated as the hydrogen ion activity. Those who desire a more detailed explanation are referred to:

Clark, "The Determination of Hydrogen Ions," 1928,
Williams and Wilkins, Baltimore, Md.
Kolthoff, "pH and Electrotitrations," 1931,
John Wiley & Sons, New York
Britton, "Hydrogen Ions," 1929, Chapman and Hall, Ltd.,
London, England
or the free booklet, "Modern pH and Chlorine Control,"
W. A. Taylor & Company, Baltimore, Md.

There are two general methods for determining pH, the electrometric (potentiometric) and the colorimetric. In the electrometric method the pH is determined by measuring with a potentiometer the voltage developed between two electrodes of special character in contact with the solution. The fundamental pH method is based on the use of the hydrogen electrode, a platinized electrode saturated with pure hydrogen gas. All other methods are secondary whether electrometric or colorimetric.

In the colorimetric determination of pH sensitive organic dyes known as indicators are used, which give different colors or different shades of color at different pH values. Each indicator covers a working range of 1.6 pH units so that it is possible by judicious choice of indicators to cover the pH range 0.2 to 13.6. The accurate determination pf pH is made by adding a measured amount of the indicator dye to a measured amount of the sample and comparing the resulting color with color standards of known pH value.

Approximate pH Values

Hydrochloric Acid, N.	0.1
Hydrochloric Acid, 0.1N	1.1
Hydrochloric Acid, 0.01N	2.0
Sulphuric Acid, N	0.3
Sulphuric Acid, 0.1N	1.2
Sulphuric Acid, 0.01N	2.1
Orthophosphoric Acid, 0.1N	1.5
Sulphurous Acid, 0.1N	1.5
Oxalic Acid, 0.1N	1.6
Tartaric Acid, 0.1N	2.2
Malic Acid, 0.1N	2.2
Citric Acid, 0.1N	2.2
Formic Acid, 0.1N	2.3
Lactic Acid, 0.1N	2.4
Acetic Acid, N.	2.4
Acetic Acid, 0.1N	2.9
Acetic Acid, 0.01N	3.4
Benzoic Acid, 0.01N	3.1
Alum, 0.1N	3.2
Carbonic Acid (saturated)	3.8
Hydrogen Sulphide, 0.1N	4.1
Arsenious Acid (saturated)	5.0
Hydrocyanic Acid, 0.1N	5.1
Boric Acid, 0.1N	5.2
Water, pure	7.0
Sodium Bicarbonate, 0.1N	8.4
Borax, 0.1N	9.2
Calcium Carbonate (saturated)	9.4
Ferrous Hydroxide (saturated)	9.5
Sodium Sesquicarbonate, 0.1N	10.1
Magnesia (saturated)	10.5
Potassium Cyanide, 0.1N	11.0
Ammonia, 0.01N	10.6
Ammonia, 0.1N	11.1
Ammonia, N.	11.6
Sodium Carbonate, 0.1N	11.6
Trisodium Phosphate, 0.1N	12.0
Sodium Metasilicate, 0.1N	12.6
Lime (saturated)	12.4
Potassium Hydroxide, 0.01N	12.0
Potassium Hydroxide, 0.1N	13.0
Potassium Hydroxide, N.	14.0
Sodium Hydroxide, 0.01N	12.0
Sodium Hydroxide, 0.1N	13.0
Sodium Hydroxide, N.	14.0

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Note: Block Comparators, Slide Comparators, Glass Disc Comparators, pH Meters, pH Indicators and other Hydrogen Ion Apparatus are shown on pages 214 to 219, inclusive, of the catalog.

Useful Information

Fractions of an Inch, Decimal Equivalents and Equivalent in Millimeters

Fractions	Decimal Equivalent	MM
1/64	.015625	.40
1/32	.03125	.80
3/64	.046875	1.19
1/16	.0625	1.58
5/64	.078125	1.98
3/32	.09375	2.38
7/64	.109375	2.78
1/8	.125	3.18
9/64	.140625	3.57
5/32	.15625	3.97
11/64	.171875	4.37
3/16	.1875	4.76
13/64	.203125	5.16
7/32	.21875	5.56
15/64	.234375	5.95
1/4	.250	6.35
17/64	.265625	6.75
9/32	.28125	7.14
19/64	.296875	7.54
5/16	.3125	7.94
21/64	.328125	8.33
11/32	.34375	8.73
23/64	.359375	9.13
3/8	.375	9.53
25/64	.390625	9.92
13/32	.40625	10.32
27/64	.421875	10.72
7/16	.4375	11.11
29/64	.453125	11.51
15/32	.46875	11.91
31/64	.484375	12.30
1/2	.500	12.70
33/64	.515625	13.10
17/32	.53125	13.49
35/64	.546875	13.89
9/16	.5625	14.29
37/64	.578125	14.68
19/32	.59375	15.08
39/64	.609375	15.48
5/8	.625	15.88
41/64	.640625	16.27
21/32	.65625	16.67
43/64	.671875	17.07
11/16	.6875	17.46
45/64	.703125	17.86
23/32	.71875	18.26
47/64	.734375	18.65
3/4	.750	19.05
49/64	.765625	19.45
25/32	.78125	19.83
51/64	.796875	20.24
13/16	.8125	20.64
53/64	.828125	21.03
27/32	.84375	21.43
55/64	.859375	21.83
7/8	.875	22.23
57/64	.890625	22.62
29/32	.90625	23.02
59/64	.921875	23.42
15/16	.9375	23.81
61/64	.953125	24.21
31/32	.96875	24.61
63/64	.984375	25.00
1	1.00	25.40

Instructions for Re-Uniting Separated Mercury Columns of Thermometers

It is almost impossible to entirely eliminate mercury separations in thermometers. In spite of precautions taken in manufacturing, the jarring to which thermometers are subjected in transit will cause separation of the mercury columns in a percentage of thermometers shipped.

Many different methods have been suggested for reuniting mercury separations. One of the simplest which has proved effective is as follows:

If the range of the thermometer is such that the mercury will contract into the bulb at zero Fahrenheit, place the bulb of the thermometer in a saturated mixture of salt and finely cracked ice. For lower ranges place the bulb in CO_2 snow (dry ice) and alcohol. The mercury column will contract into the bulb due to the cooling of these substances.

After the mercury has receded into the bulb, hold the thermometer in a vertical position and jar lightly against the palm of the hand or a soft pad. This causes the bubbles of gas in the bulb to rise into the column. Then allow the thermometer to warm up gradually. In most cases the mercury will expand into the bore, free of separations. The bulb only should be immersed in the dry ice to obtain the best results, because if the mercury column above the bulb freezes, the expansion of the mercury in the bulb may break the bulb.

The cooling method of joining separated mercury columns is the safest and is much to be preferred to attempts to join the column by heating which, unless performed very carefully, is very likely to result in either breakage or serious damage to the instrument.

If the required materials for this procedure are not available, the thermometer should be very carefully packed, marked "Fragile—Handle with Care," insured against damage, and sent to us with your instructions.

Useful Information

Weights and Measures

Conversion Table of Troy, Avoirdupois and Metric Weights

		Troy Grains	Troy Dwt.	Troy Ounces	Troy Pounds	Avoir. Ounces	Avoir. Pounds	Milli-Grams	Grams	Kilo Grams
1 Troy Grain	=	1.	.041667	.0020833	.0001736	.0022857	.000143	64.7989	.064799	.0000648
1 Troy Dwt.	=	24.	1.	.05	.004166	.0548571	.003428	1555.18	1.55518	.001556
1 Troy Ounce	=	480.	20.	1.	.083333	1.097143	.068571	31103.5	31.1035	.03110
1 Troy Pound	=	5760.	240.	12.	1.	13.16571	.822857	373241.8	373.242	.373241
1 Avoir. Ounce	=	437.5	18.2292	.911458	.07595	1.	.06250	28349.53	28.3495	.028359
1 Avoir. Pound	=	7000.	291.667	14.5833	1.21528	16.	1.	453592.4	453.592	.453592
1 Milligram	=	.01543	.000643	.000032	.000003	.000035	.000002	1.	.001	.000001
1 Gram	=	15.4324	.643015	.032151	.002679	.035274	.00220	1000.	1.	.001
1 Kilogram	=	15432.4	643.015	32.1507	2.67923	35.2739	2.20462	1000000.	1000.	1.

Troy Weight

24 Grains = 1 Dwt.
20 Dwt. = 1 Oz.
12 Oz. = 1 Lb.

Avoirdupois Weight

16 Drachms = 1 Oz.
16 Oz. = 1 Lb.
100 Lb. = 1 Cwt.
2000 Lb. = 20 Cwt. = 1 Short Ton

Apothecaries' Weight

20 Grains = 1 Scruple
3 Scruples = 1 Drachm
8 Drachms = 1 Oz.
12 Oz. = 1 Lb.

Metric Weight

1 Milligram = .001 Gram
10 Milligrams = .01 Gram
= 1 Centigram
10 Centigrams = .1 Gram
= 1 Decigram
10 Decigrams = 1 Gram
1000 Grams = 1 Kilogram

Conversion Table of Liquid Measure

		Milli-liters	Liters	Minims	Fluid Drams	Fluid Ounces	Pints	Quarts	Gallons	Cubic Inches
1 Milliter	=	1.	0.001	16.231	0.270518	0.03381	0.002113	0.00106	0.00026	0.06103
1 Liter	=	1000.	1.	16231.	270.518	33.8147	2.1134	1.0567	0.2642	61.025
1 Minim	=	0.06161		1.	0.01667	0.00208	0.00013			0.00376
1 Fl. Dram	=	3.69666	0.003696	60	1.	0.125	0.0078	0.0039		0.22558
1 Fl. Ounce	=	29.5729	0.02957	480	8	1.	0.0625	0.03125	0.00078	1.80469
1 Pint	=	473.167	0.47317	7680	128	16	1.	0.5	0.125	28.875
1 Quart	=	946.33	0.94633	15360	256	32	2	1.	0.25	57.75
1 Gallon	=	3785.33	3.78533	61440	1024	128	8	4	1.	231.0

Liquid Measure, U. S.

4 Fluid Ounces = 1 Gill
4 Gills = 1 Pint
2 Pints = 1 Quart
4 Quarts = 1 Gallon
31½ Gallons = 1 Bbl.
2 Bbls. = 1 Hogshead

Liquid Measure, Metric

1 Milliter (ml.) = 1.000027 Cubic Centimeter
1000 Milliters = 1 Liter

Liquid Measure, Apothecary

60 Minims = 1 Dram
8 Drams = 1 Fluid Ounce
16 Fluid Ounces = 1 Pint
8 Pints = 1 Gallon

Specific Gravities—Melting Points of Metals

	Specific Gravity Approx. Mean Value Used in Calculation Weight	Wt. Per Cubic Foot	Wt. Per Cubic Inch	Approx. Melting Points Fahr.	Approx. Melting Points Cent.
Aluminum	2.67	166.5	0.0963	1215°	657°
Antimony	6.76	421.6	0.2439	1166°	630°
Barium	3.75			1562°	850°
Bismuth	9.82	612.4	0.3544	516°	269°
Brass: Copper and Zinc					
80 20	8.60	536.3	0.3103	1800°	982°
70 30	8.40	523.8	0.3031		
60 40	8.36	521.3	0.3017		
50 50	8.20	511.4	0.2959		
Bronze: Copper 95 80 Tin 5 20	8.853	552.	0.3195	1900°	1037°
Cadmium	8.65	539.	0.3121	600°	322°
Chromium	5.0	311.8	0.1804	2759°	1515°
Gold—pure	19.258	1200.9	0.6949	1915°	1064°
Copper	8.853	552.	0.3195	1980°	1083°
Iron, Cast (white)	7.218	450.	0.2604	1975°	1075°
Iron, Cast (gray)	7.03			2192°	1200°
Iron, Wrought	7.70	480.	0.2779	3000°	1650°
Lead	11.38	709.7	0.4106	625°	327°
Manganese	8.	499.	0.2887	2273°	1245°
Magnesium	1.75	109.	0.0641	1200°	657°
Mercury 32°	13.61	848.6	0.4908	39° and boils at 680°	
60°	13.58	846.8	0.4911		
212	13.38	834.4	0.4828		
Nickel	8.8	548.7	0.3174	2804	1465°
Platinum	21.5	1347.0	0.7758	3236	1780
Potassium	0.865	53.9	0.0312	143	62°
Silver	10.505	655.1	0.3791	1750°	962°
Sodium	0.97	60.5	0.0350	206°	97°
Tin	7.350	458.3	0.2652	442°	227°
Tungsten	17.3	1078.	0.6243	5792°	3200°
Zinc	7.00	436.5	0.2526	780°	419°

Useful Information

Converson of Thermometer Scales

Centigrade
Water Freezes at 0°
Water Boils at 100°

Centigrade
=5/9 (F) -32
=5/4 (R)

Fahrenheit
Water Freezes at 32°
Water Boils at 212°

Fahrenheit
=9/5 (C) -32
=9/4 (R) -32

Reaumur
Water Freezes at 0°
Water Boils at 80°

Reaumur
=4/5 (C)
=4/9 (F) -32

Rules and Tables for Converting Temperature Readings From One Scale Into Those of Another

To convert

Centigrade degrees into **Fahrenheit:**
Multiply by 9, divide the product by 5 and add 32. When the temperature is below 0° Centigrade deduct 32 instead of adding.

Centigrade degrees into **Reaumur:**
Multiply by 4 and divide by 5.

Fahrenheit degrees into **Centigrade:**
Subtract 32, multiply by 5 and divide the product by 9. When the temperature is below 0° Fahrenheit add 32 instead of subtracting.

Fahrenheit degrees into **Reaumur:**
Subtract 32, multiply by 4 and divide by 9.

Reaumur degrees into **Centigrade:**
Multiply by 5 and divide by 4.

Reaumur degrees into **Fahrenheit:**
Multiply by 9, divide by 4 and add 32. When the temperature is below 0° Reaumur deduct 32 instead of adding.

F.	C.
-56	-48.9
-54	-47.8
-52	-46.7
-50	-45.6
-48	-44.4
-46	-43.3
-44	-42.2
-42	-41.1
-40	-40
-38	-38.9
-36	-37.8
-34	-36.7
-32	-35.6
-30	-34.4
-28	-33.3
-26	-32.2
-24	-32.1
-22	-30
-20	-28.9
-18	-27.8
-16	-26.7
-14	-25.6
-12	-24.4
-10	-23.3
- 8	-22.2
- 6	-21.1
- 4	-20
- 2	-18.9
0	-17.8
2	-16.7
4	-15.6
6	-14.4
8	-13.3
10	-12.1
12	-11.1
14	-10
16	- 8.9
18	- 7.8
20	- 6.7
22	- 5.6
24	- 4.4
26	- 3.3
28	- 2.2
30	- 1.1
32	0
34	1.1
36	2.2
38	3.3
40	4.4
42	5.6
44	6.7
46	7.8
48	8.9
50	10
52	11.1
54	12.2
56	13.3
58	14.4
60	15.6
62	16.7
64	17.8
66	18.9
68	20
70	21.1
72	22.2
74	23.3
76	24.4
78	25.6
80	26.7
82	27.8
84	28.9
86	30
88	31.1
90	32.2
92	33.3
94	34.4
96	35.6
98	36.7
100	37.8
102	38.9
104	40
106	41.1
108	42.2
110	43.3
112	44.4
114	45.6
116	46.7
118	47.8
120	48.9
122	50
124	51.1
126	52.2
128	53.3
130	54.4
132	55.6
134	56.7
136	57.8
138	58.9
140	60
142	61.1
144	62.2
146	63.3
148	64.4
150	65.6
152	66.7
154	67.8
156	68.9
158	70
160	71.1
162	72.2
164	73.3
166	74.4
168	75.6
170	76.7
172	77.8
174	78.9
176	80
178	81.1
180	82.2
182	83.3
184	84.4
186	85.6
188	86.7
190	87.8
192	88.9
194	90
196	91.1
198	92.2
200	93.3
202	94.4
204	95.6
206	96.7
208	97.8
210	98.9
212	100
250	121.1
300	148.9
302	150
350	176.7
392	200
400	204.4
450	232.2
464	240
500	260
572	300
600	315.5
662	350
700	371.1
752	400
800	426.7
842	450
900	482.2
932	500
1000	537.7
1022	550
1100	593.3
1112	600
1200	648.8
1292	700
1300	704.4
1400	760
1472	800
1500	815.5
1600	871.1
1652	900
1700	926.6
1800	982.2
1832	1000
1900	1037.7
2000	1093.3
2012	1100
2100	1148.8
2192	1200
2200	1204.4
2300	1260
2372	1300
2400	1315.5
2500	1371.1
2552	1400
2600	1426.6
2700	1482.2
2732	1500
2800	1537.7
2900	1593.3
2912	1600
3000	1648.7
3092	1700
3100	1704.4
3200	1760
3272	1800
3300	1815.5
3400	1871.1
3452	1900
3500	1926.6

Useful Information

Table Of Temperature of Boiling Water (F), Corresponding to the Height of Barometer and Altitude Above Sea Level

Thermo. Degrees	Baro. Inches	Alti. Feet
184.0	16.79	15221
.2	16.86	15112
.4	16.93	15003
.6	17.00	14895
.8	17.08	14772
185.0	17.15	14649
.2	17.23	14543
.4	17.31	14421
.6	17.38	14315
.8	17.46	14195
186.0	17.54	14075
.2	17.62	13956
.4	17.70	13837
.6	17.78	13718
.8	17.86	13601
187.0	17.93	13498
.2	18.00	13396
.4	18.08	13280
.6	18.16	13164
.8	18.24	13049
188.0	18.32	12934
.2	18.40	12820
.4	18.48	12706
.6	18.56	12593
.8	18.64	12480
189.0	18.72	12367
.2	18.80	12256
.4	18.88	12144
.6	18.96	12033
.8	19.04	11923
190.0	19.13	11799
.2	19.21	11690
.4	19.29	11581
.6	19.37	11472
.8	19.45	11364
191.0	19.54	11243
.2	19.62	11136
.4	19.70	11029
.6	19.78	10923
.8	19.87	10804
192.0	19.96	10685
.2	20.05	10567
.4	20.14	10450
.6	20.22	10346
.8	20.31	10230
193.0	20.39	10127
.2	20.48	10011
.4	20.57	9896
.6	20.65	9794
.8	20.73	9693
194.0	20.82	9579
.2	20.91	9466
.4	21.00	9353
.6	21.09	9241
.8	21.18	9130
195.0	21.26	9031
.2	21.35	8920
.4	21.44	8810
.6	21.53	8700
.8	21.62	8590
196.0	21.71	8481
.2	21.81	8361
.4	21.90	8253
.6	21.99	8145
.8	22.08	8038
197.0	22.17	7932
.2	22.27	7814
.4	22.36	7708
.6	22.45	7602
.8	22.54	7498
198.0	22.64	7381
.2	22.74	7266
.4	22.84	7151
.6	22.93	7048
.8	23.02	6945
199.0	23.11	6843
.2	23.21	6729
.4	23.31	6617
.6	23.40	6516
.8	23.49	6415
200.0	23.59	6304
.2	23.69	6193
.4	23.79	6082
.6	23.89	5972
.8	23.98	5874
201.0	24.08	5764
.2	24.18	5656
.4	24.28	5547
.6	24.38	5440
.8	24.48	5332
202.0	24.58	5225
.2	24.68	5119
.4	24.78	5013
.6	24.88	4907
.8	24.98	4802
203.0	25.08	4697
.2	25.18	4593
.4	25.28	4489
.6	25.38	4386
.8	25.49	4272
204.0	25.59	4169
.2	25.70	4057
.4	25.88	3945
.6	25.91	3844
.8	26.01	3742
205.0	26.11	3642
.2	26.22	3532
.4	26.33	3422
.6	26.43	3322
.8	26.54	3213
206.0	26.64	3115
.2	26.75	3007
.4	26.86	2899
.6	26.97	2792
.8	27.08	2685
207.0	27.18	2589
.2	27.29	2483
.4	27.40	2377
.6	27.51	2272
.8	27.62	2167
208.0	27.73	2063
.2	27.84	1959
.4	27.95	1856
.6	28.06	1753
.8	28.17	1650
209.0	28.29	1539
.2	28.40	1437
.4	28.51	1336
.6	28.62	1235
.8	28.73	1134
210.0	28.85	1025
.2	28.97	916
.4	29.09	808
.6	29.20	709
.8	29.31	610
211.0	29.42	512
.2	29.54	405
.4	29.65	308
.6	29.77	202
.8	29.88	105
212.0	30.00	sea level
below sea level		
.2	30.12	–104
.4	30.24	–206
.6	30.35	–304
.8	30.47	–405
213.0	30.59	–512
.2	30.71	–613
.4	30.82	–714
.6	30.93	–813

Water

Note—These figures are all for water at its maximum density, that is, at a temperature of 39.2° Fahrenheit.

1 cubic foot of water = 62.425 pounds, = 28,3153 kilos, = 7.48 gallons.

1 cubic inch of water = 0.036125 pounds, = 252.88 grains, = 16.386 grams.

1 ton of water = 32.038 cubic feet, = 239.665 gallons.

1 pound of water = 0.016019 cubic foot, = 0.47933 quart, = 27.681 cubic inches, = 0.45359 liter.

1 gallon of water = 8.3448 pounds.

1 cubic meter of water = 2204.6 pounds.

1 kilo of water, or 1 liter = 2.2046 pounds, = 0.035317 cubic foot, = 61.027 cubic inches, = 1.0567 quarts.

1 cubic centimeter of water = 1 gram, = 15.432 grains.

Rules for Determining Size and Speed of Pulleys, Sheaves, Gears or Sprocket Wheels

The driving pulley is called the driver, and the driven pulley the driven.

If the number of teeth in gears or sprocket wheels is used instead of diameter in these calculations, number of teeth must be substituted whenever diameter occurs.

To determine diameter of driver, the diameter of the driven and its revolutions, and also revolutions of driver being given.

$$\frac{\text{Diameter of Driven} \times \text{Revolutions of Driven}}{\text{Revolutions of Driver}} = \text{Diam. of Driver.}$$

To determine diameter of driven, the revolutions of the driven and diameter and revolutions of the driver being given.

$$\frac{\text{Diameter of Driver} \times \text{Revolutions of Driver}}{\text{Revolutions of Driven}} = \text{Diam. of Driven.}$$

To determine the revolutions of driver, diameter and revolutions of driven, and diameter of driver being given.

$$\frac{\text{Diameter of Driven} \times \text{Revolutions of Driven}}{\text{Diameter of Driver}} = \text{Rev. of Driver.}$$

To determine the revolutions of the driven, the diameter and revolutions of driver, and diameter of driven being given.

$$\frac{\text{Diameter of Driver} \times \text{Revolutions of Driver.}}{\text{Diameter of Driver}} = \text{Rev. of Driven.}$$

Ohm's Law for Direct or Single Phase Non-Inductive Alternating Current

Let

I = Ampere = unit of current strength or rate of flow.
E = Volt = unit of electro-motive force or electric pressure.
R = Ohm = unit of resistance to flow of current.
W = Watt = unit of power.

$$\text{Then } I = \frac{E}{R} \qquad E = I\,R \qquad R = \frac{E}{I}$$

$$W = IE = \frac{E^2}{R} = I^2R$$

1000W = 1 K. W. or kilowatt; this is the usual unit of measure of electric power. 1 kilowatt hour or K. W. H. is the work done by one Kilowatt in one hour.

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